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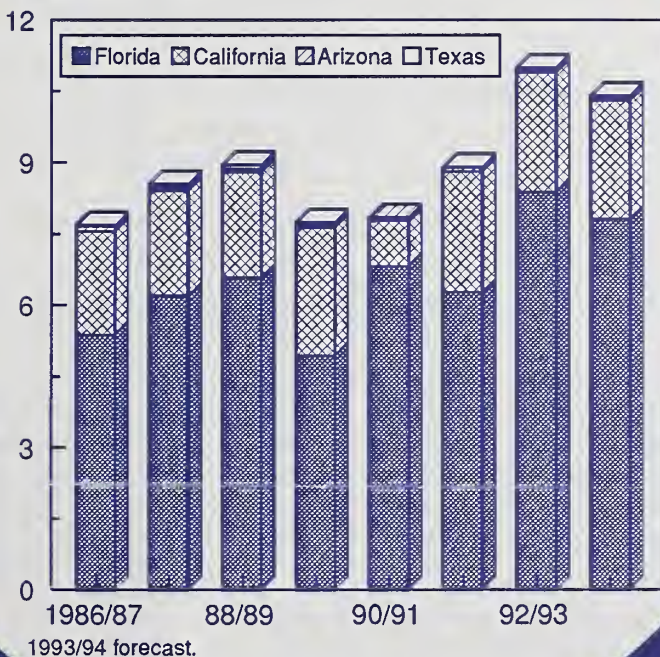
FTS-269
March 1994

Fruit and Tree Nuts

Situation and Outlook Report

Orange Production by State

Million short tons



Higher Fruit Prices Expected in First Half of 1994

Retail fresh fruit prices are expected to run ahead of a year earlier during the first half of 1994, led by moderately higher prices for apples, bananas, navel oranges, and grapefruit.

Lower supplies have resulted in higher grower prices for several fruits, including grapefruit (25 percent above a year earlier in February 1994), oranges (up 65 percent), apples (up 12 percent), and strawberries (up 8 percent). Larger supplies, though, brought lower prices for lemons and pears.

Reduced supplies of fresh-market navel oranges and grapefruit are expected to contribute to higher-than-year-earlier consumer fruit prices in the coming months. However, some navel oranges and grapefruits marketed in early 1994 were not as sweet as usual, which reduced demand and retail prices. Fruit quality has since improved (a normal maturing of the fruit), resulting in higher prices more consistent with smaller 1993/94 crops. Also, domestic navel orange shipments have not been regulated this season. This may have contributed to a higher proportion of the crop harvested earlier in the season and to lower prices in January 1994.

Smaller supplies of Golden Delicious and McIntosh apples, along with a high-quality Red Delicious crop in the western U.S., have resulted in moderately higher apple prices since September 1993, (based on the fresh apple Consumer Price Index, or CPI). Apple quality is expected to remain good, which should keep apple prices above a year ago for the balance of the 1993/94 season. In January and February, generally lower prices for imported fruit from Chile, including grapes, peaches, plums, and pears (as well as domestic pears), partially offset higher prices for apples and bananas.

Stronger banana prices have also pushed the CPI higher since December. Trade reports indicate that reduced rainfall and cooler temperatures in South and Central America lowered exportable supplies of bananas. Reportedly, production may be declining in Ecuador and other countries because of lower banana acreage.

If banana prices remain strong, and orange, apple, and grapefruit prices continue higher as expected, the fresh fruit CPI will likely stay above a year earlier until at least May or June when Valencia oranges and freshly harvested noncitrus fruit become increasingly available, and banana prices seasonally decline. The only fruit production (with harvest in 1994) currently forecast is Valencia oranges. A larger Valencia orange crop is expected to lower orange prices (relative to late spring navel prices and year earlier prices). Many of the remaining fruit crops (mostly non-citrus) are still passing through the bloom and fruit setting periods, and it is too early to forecast production.

Processed fruit prices have been fairly stable in recent months. The processed fruit CPI has been between 133 and 134 since last fall. Slightly smaller supplies of orange juice led to a gradual increase in orange juice prices, but ample supplies and lackluster demand have kept the prices of some other processed fruit from rising. In February 1994, f.o.b. prices for canned pears, peaches, fruit cocktail, and apricots were about the same as a year earlier.

Table 1--U.S. monthly grower price indexes, 1992-94

Month	All fruit index			Fresh fruit index		
	1992	1993	1994	1992	1993	1994
--1977=100--						
January	207	138	150	215	138	152
February	203	132	153	211	130	156
March	203	121		211	117	
April	203	129		212	127	
May	195	141		203	140	
June	180	151		184	152	
July	143	172		145	178	
August	154	211		158	227	
September	143	258		145	284	
October	148	285		149	317	
November	159	183		161	192	
December	156	166		158	171	

Source: National Agricultural Statistics Service, USDA.

Table 2--U.S. monthly consumer fruit price indexes, 1992-94

Month	Fresh fruit			Processed fruit		
	1992	1993	1994	1992	1993	1994
--1982-84=100--						
January	189	191	207	136	133	135
February	183	187	195	139	135	133
March	189	184		139	132	
April	187	185		140	132	
May	190	188		140	131	
June	183	176		138	130	
July	173	179		138	131	
August	181	185		138	132	
September	189	193		138	132	
October	182	198		136	133	
November	181	194		136	133	
December	182	205		135	134	

Frozen fruit and juice			Canned and dried fruit		
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--1982-84=100--

January	137	133	134	130	132	134
February	140	135	132	131	132	133
March	141	132		130	132	
April	142	132		131	132	
May	142	129		131	133	
June	140	128		131	134	
July	140	130		132	134	
August	139	131		132	135	
September	139	132		132	132	
October	137	132		131	133	
November	136	133		130	132	
December	135	133		131	133	

Source: Bureau of Labor Statistics, Department of Labor.

Table 3--U.S. monthly retail prices for selected fruits and juice, 1991-94

Month	Navel oranges				Orange juice, concentrate 1/				Grapefruit			
	1991	1992	1993	1994	1991	1992	1993	1994	1991	1992	1993	1994
	--Dollars per pound--				--Dollars per pound--				--Dollars per pound--			
January	0.823	0.643	0.514	0.505	2.005	1.879	1.677	1.674	0.611	0.520	0.518	0.473
February	.930	.616	.506	.496	1.971	1.963	1.753	1.648	.595	.513	.505	.462
March	--	.563	.506		1.902	1.922	1.619		.603	.524	.468	
April	--	.537	.521		1.909	1.976	1.627		.615	.552	.495	
May	--	.573	.549		1.877	1.959	1.572		.625	.625	.447	
June	--	--	--		1.848	1.933	1.587		.686	.648	.475	
July	--	--	--		1.807	1.929	1.558		.695	.671	.529	
August	--	--	--		1.767	1.906	1.610		.676	.701	.611	
September	--	--	--		1.756	1.877	1.626		.662	.731	.628	
October	--	--	--		1.718	1.830	1.615		.580	.731	.629	
November	.731	.571	.694		1.771	1.774	1.643		.544	.549	.544	
December	.652	.516	.556		1.739	1.700	1.672		.529	.524	.499	
	Lemons				Red Delicious apples				Bananas			
	1991	1992	1993	1994	1991	1992	1993	1994	1991	1992	1993	1994
	--Dollars per pound--				--Dollars per pound--				--Dollars per pound--			
January	1.133	1.056	0.920	0.942	0.810	0.876	0.810	0.789	0.438	0.428	0.426	0.440
February	1.096	1.003	.868	.844	.838	.886	.817	.810	.485	.493	.475	.496
March	1.079	.933	.879		.843	.899	.802		.577	.517	.475	
April	1.183	.921	.901		.860	.913	.802		.547	.484	.483	
May	1.271	.981	.971		.892	.925	.815		.584	.445	.472	
June	1.296	.988	1.058		.936	.962	.835		.532	.463	.446	
July	1.338	1.024	1.222		.956	.990	.854		.516	.432	.448	
August	1.294	1.009	1.291		.964	1.015	.904		.416	.509	.422	
September	1.288	1.144	1.341		.974	.933	.939		.432	.459	.395	
October	1.322	1.110	1.341		.846	.765	.850		.395	.442	.405	
November	1.215	1.007	1.159		.839	.753	.798		.431	.422	.404	
December	1.210	.904	1.054		.864	.764	.778		.419	.404	.414	
	Anjou pears				Thompson seedless grapes				Strawberries 2/			
	1991	1992	1993	1994	1991	1992	1993	1994	1991	1992	1993	1994
	--Dollars per pound--				--Dollars per pound--				--Dollars per 12-oz. pint--			
January	0.739	0.830	0.777	0.827	1.942	1.782	1.831	2.010	--	--	--	--
February	.795	.793	.805	.815	1.483	1.323	1.480	1.373	1.467	1.430	1.467	1.318
March	.812	.855	.855		1.432	1.302	1.330		1.268	1.173	1.260	
April	.827	.834	.866		1.502	1.409	1.467		1.112	.960	.908	
May	.849	.839	.881		--	--	--		.976	.831	.874	
June	.976	.830	.933		--	1.370	1.406		.924	1.048	1.066	
July	--	--	--		1.376	1.017	1.338		.948	.988	1.013	
August	--	--	--		1.073	.928	1.210		.961	1.185	1.069	
September	--	--	--		1.019	.992	1.179		1.014	1.473	1.151	
October	--	--	--		1.110	1.162	1.310		1.035	1.190	1.261	
November	--	--	--		1.406	1.595	1.601		--	--	--	
December	.881	.803	.891		1.653	--	1.962		--	--	--	

-- = Insufficient marketing to establish price.

1/ Price of 12-ounce container, 42 degrees Brix.

2/ Dry pint.

Source: Bureau of Labor Statistics, U.S. Department of Labor.

Navel Orange Crop Smaller in 1993/94

The 1993/94 California-Arizona (CA-AZ) navel orange crop is forecast down 13 percent from last year. Quality improved and prices increased in late February. A larger CA-AZ Valencia crop is expected to put downward pressure on prices this summer.

Total U.S. orange production in 1993/94 is expected to be down 5 percent from the large crop in 1992/93. CA-AZ navel production is down 13 percent while Valencia production is forecast 21 percent higher than last year. Almost three-fourths of the CA-AZ orange crop was sent to the fresh market in 1992/93. The Florida orange crop, which is mostly processed, is expected to be down 5 percent. Harsh winter weather in many areas of the United States did not affect the 1993/94 orange crop in Florida or California.

Fresh Market Orange Prices Mixed in 1993/94

A smaller CA-AZ navel crop led to expectations of higher than year-earlier fresh-market orange prices throughout the season. However, f.o.b. orange prices were lower in January and early February than a year earlier because slow maturing fruit (less sweet compared with the vintage 1992/93 crop) reduced domestic demand. Also, a pattern of severe winter weather in the Midwest and Northeast caused marketing and distribution problems.

Prices strengthened in late February as quality improved and more moderate weather prevailed. For the shipping

week ending February 17, the average f.o.b. price for CA-AZ navels was above a year earlier for the first time since late December 1993. Weekly average f.o.b. prices through mid-March remained higher than a year earlier.

Figure 2

F.o.b. Orange Prices for California-Arizona

\$/37-1/2 lb. carton

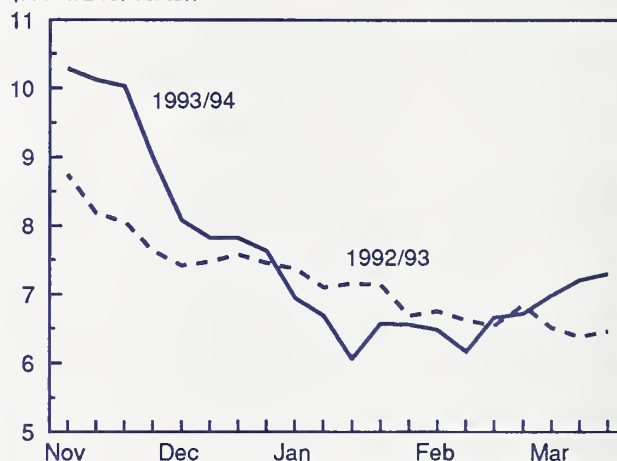


Table 4--Oranges: Utilized production, 1991/92-1992/93 and indicated 1993/94 1/

Crop and State	Utilized		Indicated 1993/94		Utilized		Indicated 1992/93	
	1991/92	1992/93	10-12-93	3-10-94	1991/92	1992/93	10-12-93	3-10-94
--1,000 boxes 2/--								
Early, midseason, and navel varieties 3/:								
Arizona	780	700	800	700	29	26	30	26
California	35,100	43,800	38,000	38,000	1,317	1,642	1,425	1,425
Florida	83,400	114,300	108,000	108,000	3,753	5,143	4,860	4,860
Texas	20	450	370	500	1	20	16	21
Total	119,300	159,250	147,170	147,200	5,100	6,831	6,331	6,332
Valencias:								
Arizona	1,600	1,150	1,200	1,100	60	43	45	41
California	32,300	23,000	27,000	28,000	1,211	863	1,013	1,050
Florida	56,400	72,200	64,000	66,000	2,538	3,249	2,880	2,970
Texas	10	60	120	120	0	2	5	5
Total	90,310	96,410	92,320	95,220	3,809	4,157	3,943	4,066
All oranges:								
Arizona	2,380	1,850	2,000	1,800	89	69	75	67
California	67,400	66,800	65,000	66,000	2,528	2,505	2,438	2,475
Florida	139,800	186,500	172,000	174,000	6,291	8,392	7,740	7,830
Texas	30	510	490	620	1	22	21	26
Total	209,610	255,660	239,490	242,420	8,909	10,988	10,274	10,398

1/ The crop year begins with bloom of the first year shown and ends with completion of harvest the following year.

2/ Net pounds per box: California and Arizona-75, Florida-90, Texas-85.

3/ Navel and miscellaneous varieties in California and Arizona. Early and midseason varieties in Florida and Texas, including small quantities of tangerines in Texas.

Source: National Agricultural Statistics Service, USDA.

Aside from the quality issue, weekly navel orange prices appear to be following a more typical seasonal pattern usually observed with an unregulated commodity. This pattern involves relatively high prices early in the season before the crop generally matures and supplies are limited. Prices then dip during mid-season as the crop matures and growers market fruit more quickly. Finally, prices increase as supplies diminish and costs of holding fruit increase.¹ If this pattern holds for 1993/94, navel orange prices would continue to edge higher this spring until the large Valencia crop begins to pressure orange prices. The CA-AZ weekly navel orange volume controls, which limit domestic fresh shipments, were lifted on January 1, 1993, and have not been used this season.

With no volume controls, a higher percentage of the crop was harvested in the early part of the season. At the end of January, 40 percent of the CA-AZ navel crop had been harvested, compared with the 4-year average of 36 percent (excluding the freeze year of 1990/91). This may also have contributed to weak f.o.b. prices for navel oranges in January and is likely contributing to the more typical price pattern this season. Because of the smaller California crop, total domestic fresh shipments from October 1993 through January 1994 were down 8 percent from the same period a year earlier.

Because of a smaller orange crop, Florida's fresh domestic orange shipments through mid-March were down 7 percent from a year ago. Florida's f.o.b. prices for early- and mid-season oranges have been running nearly \$1 per carton higher than a year earlier, while navel prices were \$1-2 higher.

Summer Orange Prices Could Be Lower in 1994

The March 1 forecast for 1993/94 CA-AZ Valencias, the most available fresh orange during the summer and early fall, was up 21 percent from last season. A bigger crop in southern California (39 percent of the total 1992/93 crop) is forecast to more than offset slightly smaller crops in central California (55 percent of the total crop) and the California desert/Arizona region (6 percent of the total crop). A larger total Valencia crop is expected to push the 1993/94 f.o.b. average price for CA-AZ fresh-market Valencias below the 1992/93 average, which was \$8.43 per 37 1/2 pound carton. Fruit quality is reported as average. Fruit sizes in central California are projected to be larger than last year, while fruit in southern California and California desert/Arizona region are projected smaller.

Orange Exports Higher Through Mid-March

Overseas exports (excluding Canada) of CA-AZ navel oranges from October through mid-March were up 16

Table 5--Orange: Supply and utilization, 1985/86-1993/94 1/

Season 2/	Supply		Utilization		Fresh domestic consumption
	Produc- tion	Fresh imports	Pro- cessed	Fresh exports	
1,000 short tons					
1985/86	7,618	31	5,465	568	1,616
1986/87	7,889	22	5,771	584	1,556
1987/88	8,712	25	6,568	465	1,703
1988/89	9,117	9	7,062	559	1,505
1989/90	7,873	13	5,764	576	1,546
1990/91	7,961	69	6,704	257	1,068
1991/92	9,015	17	6,840	546	1,647
1992/93	11,102	11	8,661	612	1,840
1993/94f	10,503	17	8,091	612	1,817

f = Forecast.

1/ Includes Temples.

2/ Marketing season begins in September of the first year shown.

Source: Economic Research Service, USDA.

percent from a year earlier. Exports to the key markets of Japan and Hong Kong were higher. Shipments to several minor markets were also up, including Australia, Singapore, Philippines, and New Zealand.

The excellent quality of the 1992/93 crop led to increased CA-AZ Valencia orange exports last summer. In 1993/94, a larger CA-AZ Valencia crop will likely bring lower export prices, but the quality may not match the previous year.

Temple Production Down, but Tangerine and Tangelo Crops Are Up

Florida's Temple crop (a hybrid of tangerine and sweet orange) is forecast at 104,000 tons, down 8 percent from 1992/93. Like Florida's fresh oranges, temple prices have been higher since the beginning of the season in January. On the other hand, a 39-percent larger tangerine crop in Florida has resulted in lower f.o.b. prices for Dancy, Sunburst, and Honey tangerines. The California and Arizona tangerine crops are also up, 13 percent and 17 percent, respectively.

The Florida tangelo crop (a hybrid of tangerine and grapefruit) is expected to be up 12 percent in 1993/94. The stronger prices for Florida's grapefruit, fresh oranges, and temples appear to have helped increase fresh-market tangelo prices above a year earlier, despite the larger tangelo crop and lower tangerine prices.

U.S. temple, tangerine, and tangelo production are much lower than orange production. In 1992/93 fresh orange utilization was more than 8 times the fresh utilization of temples, tangerines, and tangelos combined.

¹See the special article, *An Economic Model for Analyzing Alternative Marketing Strategies for California and Arizona Navel Oranges*.

Table 6--Other citrus: Utilized production, 1991/92-1992/93 and indicated 1993/94 1/

Crop and State	Utilized		Indicated 1993/94		Utilized		Indicated 1993/94	
	1991/92	1992/93	10-12-93	3-10-94	1991/92	1992/93	10-12-93	3-10-94
	--1,000 boxes 2/--				--1,000 short tons--			
Tangelos:								
Florida	2,600	3,050	3,100	3,400	117	137	140	153
Tangerines:								
Arizona	1,200	950	1,100	1,100	45	35	41	41
California	2,440	2,200	2,500	2,500	92	83	94	94
Florida	2,600	2,800	3,800	3,900	123	133	181	185
Total	6,240	5,950	7,400	7,500	260	251	316	320
Temples:								
Florida	2,350	2,500	2,300	2,300	106	113	104	104

1/ The crop year begins with bloom of the first year shown and ends with completion of harvest the following year.

2/ Net pounds per box: tangerines-California and Arizona-75, Florida-95; Florida, tangelos-95 and Temples-90.

Source: National Agricultural Statistics Service, USDA.

Table 7--Fresh-market oranges: State-average equivalent on-tree price received by growers, 1991-94

Month	Arizona				California			
	1991	1992	1993	1994	1991	1992	1993	1994
	--Dollars/75-lb. box--				--Dollars/75-lb. box--			
January	20.20	10.63	6.68	5.75	23.80	11.53	6.48	6.95
February	19.42	6.63	3.03	4.75	27.25	7.93	5.98	5.75
March	25.52	4.41	2.22		26.10	6.84	5.72	
April	20.92	4.49	2.55		30.59	7.06	6.74	
May	25.62	3.59	1.85		28.02	7.41	6.55	
June	14.32	2.99	1.55		27.42	5.65	6.45	
July	--	2.39	-5.13		26.22	4.89	7.55	
August	--	--	--		27.32	4.59	10.75	
September	--	--	--		28.82	4.59	15.25	
October	--	12.28	--		27.02	6.46	16.35	
November	14.83	9.38	12.85		16.73	8.12	12.95	
December	12.03	7.78	7.15		12.93	7.38	8.95	
	Florida				Texas			
	1991	1992	1993	1994	1991	1992	1993	1994
	--Dollars/90-lb. box--				--Dollars/85-lb. box--			
January	11.00	6.90	2.55	4.70	--	12.00	5.30	6.94
February	8.71	7.17	2.80	3.90	--	11.50	4.94	6.60
March	8.40	6.10	1.80		--	--	6.55	
April	8.40	6.10	2.20		--	--	5.60	
May	9.10	7.10	2.90		--	--	5.60	
June	--	10.60	5.10		--	--	--	
July	--	--	--		--	--	--	
August	--	--	--		--	--	--	
September	--	--	--		--	--	--	
October	11.60	--	13.90		--	--	9.48	
November	9.40	5.70	7.20		13.10	9.33	9.50	
December	8.70	4.80	6.60		14.50	9.71	7.22	

-- = Not available.

Source: National Agricultural Statistics Service, USDA.

Orange Juice Production Down 7 Percent in 1993/94

U.S. orange juice production is forecast at 1.12 billion gallons in 1993/94, down 7 percent from the year earlier because of a smaller orange crop in Florida. Grower prices for processing oranges in Florida are up from 1992/93 lows, and retail prices for FCOJ have edged higher since last fall. The outlook calls for stable orange juice prices in the months ahead.

The March USDA forecast pegs the U.S. orange crop at 10.4 million short tons, down 5 percent from 1992/93. The Florida orange crop is expected to total 174 million 90-pound boxes, down 7 percent from last year. The Florida forecast has increased 1 percent since October 1993 because of lower-than-expected fruit droppage. The smaller 1993/94 Florida orange crop and a 4 percent smaller orange crop in Brazil (1993 harvest) have boosted grower prices for processing oranges this season. The average grower price for early/mid-season oranges in Florida was \$4.10 per 90-pound box (on tree) in February, up from only \$2.10 a year earlier. In 1993/94 the season-average grower price for processing oranges is expected to be well above the 1992/93 average of \$2.60 per box.

Orange Juice Production Revised Up

Because of larger-than-expected Florida and California orange crops and a higher Florida juice yield, the U.S. orange juice production forecast in 1993/94 has been revised up slightly from earlier forecasts to 1.12 billion gallons (single strength equivalent), but down 7 percent from 1992/93. The Florida frozen concentrated orange juice (FCOJ) yield is expected to be a record 1.57 gallons (42 degrees Brix) per box, up 1 percent from the October forecast. The California Valencia orange crop forecast increased 4 percent since October, which will add to U.S. juice production. Including imports and beginning stocks, the U.S. juice supply in 1993/94 is forecast down 4 percent from the large 1992/93 supply.

Table 8--Processing oranges: Average equivalent on-tree price received by growers, Florida, 1991-94

Month	1991	1992	1993	1994
--Dollars/90-lb. box--				
January	5.30	5.35	2.20	3.70
February	5.52	5.70	2.20	4.10
March	6.27	6.25	2.50	
April	6.48	6.65	3.20	
May	6.50	7.00	3.50	
June	--	7.40	3.70	
July	--	--	--	
August	--	--	--	
September	--	--	--	
October	3.90	--	1.90	
November	4.40	1.70	2.10	
December	4.90	2.20	3.00	

-- = Not available.

Source: National Agricultural Statistics Service, USDA.

Brazilian 1994 Crop Expected Lower

In January 1994, the Sao Paulo citrus processing industry forecast the Sao Paulo orange crop (1994 harvested) at 285 million 90-pound boxes, down 6 percent from the 1993 crop. Dry weather in October and November 1993 and outbreaks of a fungus that causes early fruit drop lowered production expectations. If the smaller crop is realized, Brazilian orange juice production would likely decline for the second year in a row. However, U.S. juice prices would not rise very much if a normal 1994/95 Florida crop provides ample domestic orange juice supplies. In the meantime, a smaller Brazilian crop could keep futures prices firm until this fall.

Table 9--United States: Orange juice supply and utilization, 1987/88-1993/94

Season 1/	Begin- ning stocks	Pro- duction	Im- port	Ex- ports	Domestic consump- tion	Ending stocks 2/
--Million SSE gallons 3/--						
1987/88	201	907	416	90	1,223	212
1988/89	212	970	383	73	1,258	232
1989/90	232	652	492	90	1,062	225
1990/91	225	876	327	96	1,174	158
1991/92	158	930	286	108	1,097	170
1992/93	170	1,212	342	114	1,393	216
1993/94 4/	216	1,122	316	119	1,319	216

1/ Season begins in December of the first year shown. 2/ Data may not add due to rounding. 3/ SSE = single-strength equivalent. 4/ Forecast, March 1994.

Sources: Economic Research Service and Foreign Agricultural Service, USDA.

Table 10--Brazilian FCOJ production and utilization, 1987/88-1993/94

Season 1/	Begin- ning stocks	Pro- duction	Domestic consump- tion	Ex- ports	Ending stocks 2/
--Million SSE gallons 3/--					
1987/88	121	998	28	1,038	53
1988/89	53	1,002	28	994	34
1989/90	34	1,476	28	1,348	134
1990/91	134	1,213	28	1,142	177
1991/92	177	1,334	25	1,390	96
1992/93	96	1,610	25	1,532	148
1993/94 4/	148	1,462	25	1,434	150

1/ Season begins in July of the first year shown.

2/ Data may not add due to rounding.

3/ SSE = single-strength equivalent.

4/ Forecast, February 1994.

Source: Foreign Agricultural Service, USDA.

Retail Orange Juice Prices Stable in 1994

Prices for near-term orange juice futures contracts on the New York Cotton Exchange have been between \$1.00-1.12 per pound solids since late October 1993. List prices for wholesale FCOJ have been \$1.30 per pound solids (bulk) since August, but actual sales have been closer to the futures price. Retail FCOJ prices increased from \$1.61 per pound of product (42 degrees Brix) in August to \$1.67 in January 1994, but then moderated to \$1.65 in February. Stable futures and wholesale prices mean that retail prices will likely remain relatively flat for at least the next several months. Favorable weather this spring and summer, in addition to more bearing acres in production, could result in a large 1994/95 crop in Florida, which would put downward pressure on prices later this year.

U.S. Import Requirements Declining

The United States will be less dependant on Brazilian imports as U.S. orange juice production increases in the coming years, when more of the young trees planted after the 1989 freeze come into full bearing. Also, the geographic center of the orange industry in Florida has shifted south, reducing the chances of freeze damage. Imports from Brazil declined to 20 percent of U.S. orange juice supplies in 1992/93 from 36 percent in 1989/90 when a freeze reduced Florida's crop. Although imports increased in 1992/93, larger orange crops and higher juice production may change the United States from a net importer of orange juice to a net exporter as early as 1996/97.

Table 11--Florida orange juice production, 1989/90-1993/94

Season	Frozen concentrate 1/	Canned single strength 2/	Chilled 2/	Total
--Million SSE gallons 3/--				
1989/90	364.7	3.4	173.7	541.8
1990/91	611.5	3.2	225.9	840.6
1991/92	587.3	2.7	220.7	810.7
1992/93	856.0	3.7	251.0	1,110.7
1993/94 4/	739.9	1.2	312.1	1,053.2

1/ Pack from fruit, Florida Citrus Processors Association. 2/ Boxes utilized estimate by Florida Department of Citrus, not from concentrate. 3/ SSE = single-strength equivalent. 4/ Forecast, March 1994.

Source: Florida Department of Citrus.

Table 12--Oranges used for frozen concentrate, Florida, 1989/90-1993/94

Season	Orange and Temple production	Used for frozen concentrate 1/	Yield per box
--Million boxes 2/--		Percent	Gallons 3/
1989/90	111.6	73.6	65.9
1990/91	154.1	104.1	67.6
1991/92	142.2	93.9	66.1
1992/93	189.0	132.2	69.9
1993/94 4/	176.3	116.7	66.2

1/ Includes tangelos, Temples, tangerines, and K-early citrus.

2/ Picking boxes weigh approximately 90 pounds.

3/ Gallons per box at 42-degrees-Brix equivalent.

4/ Forecast, March 1994.

Sources: National Agricultural Statistics Service, USDA, Florida Citrus Processors Association, and the Florida Department of Citrus.

Figure 3

Orange Juice: Near-Term Futures Contract Prices

\$/pound solids



Figure 4

Florida F.o.b. Prices for Bulk FCOJ

\$/pound solids

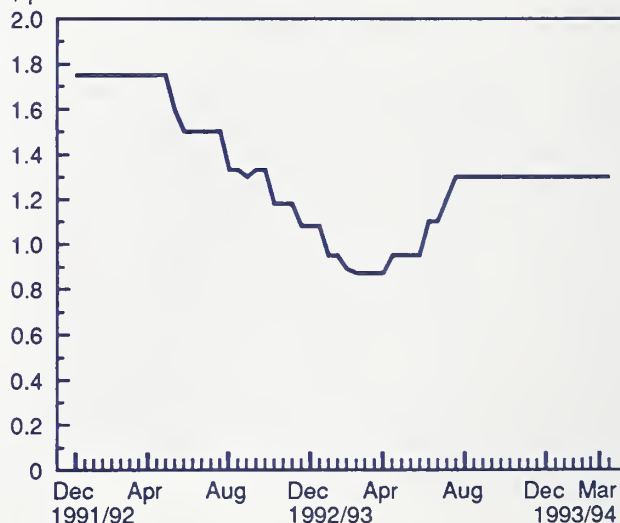


Figure 5

U.S. Average Retail Price for FCOJ

\$/pound product



Slightly Larger Lemon Crop in 1993/94, Prices Lower

Increased lemon supplies from Arizona and the California desert and weak domestic demand led to lower f.o.b. lemon prices from mid-December through February. A smaller crop is being harvested in Southern California, which could provide some support to prices during the remainder of the season.

Early season projections pointed to a slightly smaller U.S. lemon crop in 1993/94. But in January, USDA increased the U.S. lemon production forecast to 942,000 short tons, up 2 percent from October and 1 percent from the large crop in 1992/93. Favorable weather led to an increase in the Arizona lemon forecast, up 12 percent from the October forecast to 182,000 tons. The forecast for California lemon production has remained unchanged since the beginning of the 1993/94 season at 760,000 tons, nearly the same as last season.

Fruit quality is reported as average in 1993/94. However, fruit sizes are running slightly smaller than normal (152 carton count rather than 140-145), but nearly the same as last year.

Prices Sink in December 1993

F.o.b. prices were above a year earlier until shipments from Arizona and the California desert increased in mid-December. Since then, lemon prices have averaged \$7-9, down from \$10-11 per 38-pound carton a year earlier. Weekly shipments leveled off in January 1994, but weak domestic demand (possibly related to the cold weather) put additional downward pressure on prices. By mid-February, f.o.b. prices declined to \$7-7.50, down almost \$3 from February 1993 when weekly shipments were about the same.

Prices began to increase as shipments from Arizona and the California desert declined and Southern California became the primary supplier in late February. The 6 percent smaller lemon crop in Southern California could provide some price support for the remainder of the marketing year which ends July 31. Also, a strong seasonal price pattern is evident in lemon marketing, with prices usually rising in the summer when demand picks up and supplies decline.

Table 13--Lemons: Utilized production, 1991/92-1992/93 and indicated 1993/94 1/

State	Utilized		Indicated 1993/94	
	1991/92	1992/93	10-12-93	3-10-94
--1,000 short tons--				
Arizona	193	167	163	182
California	573	763	760	760
Total	766	930	923	942

1/ The crop year begins with bloom of the first year shown and ends with completion of harvest the following year.

Source: National Agricultural Statistics Service, USDA.

Weekly volume from central California has been running higher this season, adding to the pressure on prices. The central California crop, which accounts for less than 10 percent of the total CA-AZ lemon crop, is more than twice last season's. Lemon production in central California continues to recover from the severe December 1990 freeze.

Steady Exports Through February

Lemon exports from August 1, 1993, through February 26, 1994, as reported by the Lemon Administrative Committee, were 68,500 tons, nearly the same as the season earlier. Japan, the largest foreign market for U.S. lemons, receives about three-fourths of U.S. fresh-market exports.

Figure 6

F.o.b. Lemon Prices for California-Arizona

\$/38 lb. carton

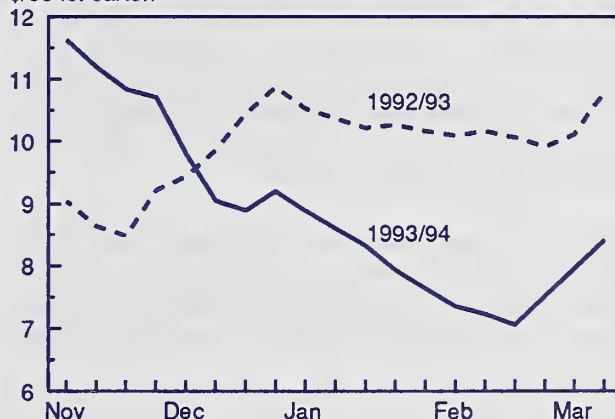


Table 14--All lemons: State-average equivalent on-tree price received by growers, 1992-94

Month	Arizona			California		
	1992	1993	1994	1992	1993	1994
--Dollars/76-lb. box--						
January	4.50	3.32	2.70	3.84	2.98	1.15
February	2.33	2.56	.12	5.20	3.01	.36
March	1.86	1.80		6.56	3.00	
April	1.79	2.37		7.21	4.00	
May	--	--		7.47	8.13	
June	--	--		8.99	15.02	
July	--	--		9.24	19.58	
August	18.25	--		9.51	23.62	
September	13.46	26.25		11.42	19.78	
October	6.62	26.06		3.37	16.47	
November	3.38	9.60		1.98	7.95	
December	3.47	3.84		2.69	4.68	

-- = Not available.

Source: National Agricultural Statistics Service, USDA.

Grapefruit Production Down in 1993/94

U.S. grapefruit production is expected to be down 9 percent in 1993/94 from a season earlier, but up 3 percent from the 3-year average. Prices have been generally higher this year, but were lower in December and January for red grapefruit because of lower internal quality.

U.S. grapefruit production is expected to total 2.38 million tons (excluding California non-desert grapefruits), down 9 percent from 1992/93. Florida, which produces over 80 percent of the U.S. total, expects to harvest 2.08 million tons of grapefruit, down 11 percent from the bumper crop in 1992/93. California desert grapefruit production is expected to be nearly the same as last year. The Texas crop will jump almost 50 percent as new trees increase yields and older trees continue to recover from the 1989 freeze. The 1993/94 U.S. crop, though smaller than last season, is 3 percent larger than the 3-year average.

Florida's F.o.b. Prices Higher in 1993/94

Smaller grapefruit supplies have led to moderately higher f.o.b. prices for fresh grapefruit in 1993/94. From November 1993 to February 1994, monthly f.o.b. prices for all Florida grapefruit (fresh-market) averaged \$6.34 per 42 1/2-pound carton, up about \$1 from the same period a year earlier. White grapefruit prices have been consistently above last season's. However, red grapefruit prices dipped below previous year in December and January, possibly because of reduced demand resulting from a low sugar-acids ratio (a measure of sweetness). In December 1993, the sugar-acids ratio for red grapefruit was 7.61, down from the 3-year average of 8.78.

Florida's red grapefruit shipments to domestic markets and Canada have been slowed by lower quality fruit, while higher prices (and lower quality to some extent) have reduced white grapefruit shipments. The sugar-acids ratio

for both white and red grapefruit has not increased as quickly through the season as it did in 1992/93. Through mid-March 1994, season-to-date shipments totaled 342,000 tons, down 14 percent from a year earlier. Red grapefruit shipments were off 13 percent and white grapefruit off 24 percent.

At the end of February, fresh market utilization as a share of total fruit harvested was 42 percent, about the same as a year earlier. If the pattern continues, domestic consumption of fresh-market grapefruit will decline in 1993/94. However, fresh utilization could pick up as maturity increases.

Export Demand Is Mixed

Weak demand in Europe and Japan led to reduced exports despite lower grapefruit prices in 1992/93. Thus far in 1993/94, exports of Florida's red grapefruit have picked up, suggesting that demand may be improving in Europe, despite somewhat lower internal grapefruit quality. However, the trade reported considerable competition from Turkey and Israel in February and March. Exports of white grapefruit, the preferred variety in Japan, were below year earlier levels through February, but increased in early March.

Together, Florida's exports (including Canada) of red and white grapefruit since the beginning of the season through mid-March 1994 totalled 346,000 tons, up 2 percent from a year earlier. If shipments in the second part of the season pick up, U.S. grapefruit exports in 1993/94 could exceed 500,000 tons.

Table 15--Grapefruit: Utilized production, 1991/92-1992/93 and indicated 1993/94 1/

Crop and State	Utilized		Indicated 1993/94		Utilized		Indicated 1993/94	
	1991/92	1992/93	10-12-93	3-10-94	1991/92	1992/93	10-12-93	3-10-94
	--1,000 boxes 2/--				--1,000 short tons--			
Florida, all	42,400	55,150	49,000	49,000	1,803	2,344	2,084	2,084
Seedless	41,200	53,400	48,000	48,000	1,752	2,270	2,041	2,041
Pink	22,100	27,700	25,000	25,000	940	1,177	1,063	1,063
White	19,100	25,700	23,000	23,000	812	1,093	978	978
Other	1,200	1,750	1,000	1,000	51	74	43	43
Arizona	2,800	2,150	2,200	2,100	89	69	70	70
California	10,000	9,500			329	313	112	
Desert Valleys	3,500	3,500	3,500	3,300	112	112	112	111
Other areas	6,500	6,000	3/	3/	217	201	3/	3/
Texas	65	1,875	2,700	2,800	3	75	108	112
Total	55,265	68,675	57,400	57,200	2,224	2,801	2,374	2,377

1/ The crop year begins with bloom of the first year shown and ends with completion of harvest the following year. 2/ Net pounds per box: California desert and Arizona-64 in 1991/92 and 1992/93, 67-starting in January 1994; California other areas-67, Florida-85 and Texas-80. 3/ The first forecast for California grapefruit "other area" will be available as of April 1, 1994.

Source: National Agricultural Statistics Service, USDA.

Table 16--Grapefruit: Supply and utilization, 1985/86-1993/94

Season 1/	Supply		Utilization		
	Production	Fresh imports	Processed	Fresh exports	Fresh domestic consumption
1,000 short tons					
1985/86	2,352	3	1,264	353	738
1986/87	2,586	2	1,386	436	766
1987/88	2,801	6	1,469	523	815
1988/89	2,844	4	1,449	587	812
1989/90	1,978	5	1,096	337	550
1990/91	2,256	8	1,015	513	736
1991/92	2,224	12	975	506	755
1992/93	2,801	13	1,522	486	806
1993/94f	2,579	13	1,324	518	750

f = Forecast.

1/ Marketing season begins in September of the first year shown.

Source: Economic Research Service, USDA.

Figure 7

All Grapefruit: Production by State

1,000 short tons

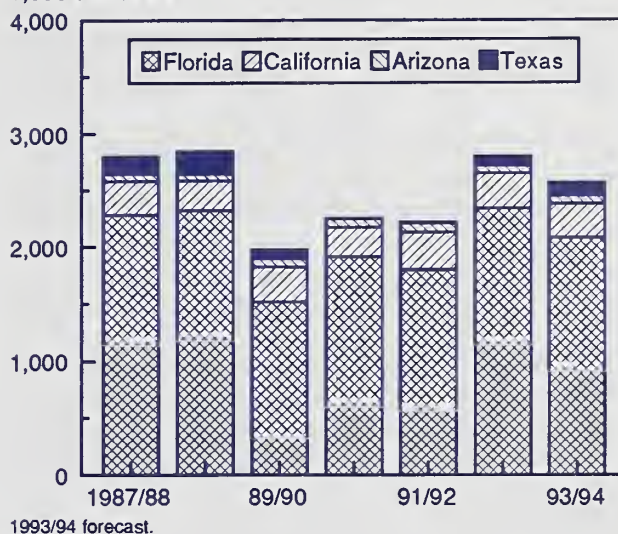


Table 17--Grapefruit: Monthly equivalent on-tree price received by growers, 1991-94

Month	Florida											
	All				Fresh market				Processing			
	1991	1992	1993	1994	1991	1992	1993	1994	1991	1992	1993	1994
--Dollars/85-lb. box--												
January	5.71	6.04	2.92	3.20	9.10	7.96	4.06	4.90	2.17	4.20	1.69	1.03
February	4.73	6.22	2.46	3.35	8.75	9.04	4.68	5.40	2.33	4.51	0.70	1.90
March	5.72	7.23	1.56		9.82	9.92	4.09		2.15	4.65	0.70	
April	5.88	8.14	1.99		9.62	10.07	4.58		1.57	4.93	0.84	
May	4.72	--	1.62		7.73	--	3.21		1.36	--	0.99	
June	--	--	1.53		--	--	3.00		--	--	0.60	
July	--	--	--		--	--	--		--	--	--	
August	--	--	--		--	--	--		--	--	--	
September	9.19	--	--		10.15	--	--		2.05	--	--	
October	6.67	6.15	8.60		7.99	7.41	10.22		2.23	0.06	0.16	
November	6.55	4.32	4.28		8.10	5.38	5.65		3.24	1.46	0.53	
December	6.15	3.94	4.13		7.72	5.28	5.63		3.67	1.79	0.56	
	Fresh-Arizona				Fresh-California				Fresh-Texas			
	1991	1992	1993	1994	1991	1992	1993	1994	1991	1992	1993	1994
--Dollars/64-lb. box--												
January	7.01	4.42	3.23	1.98	9.87	7.02	5.88	1.83	--	14.00	6.68	3.73
February	8.61	4.82	3.13	2.43	7.59	6.33	3.99	1.31	--	--	5.83	2.83
March	9.11	5.42	1.96		8.40	6.40	3.35		--	--	4.61	
April	8.31	6.92	2.43		9.41	7.64	3.68		--	--	4.46	
May	8.51	7.32	0.91		9.14	8.34	3.37		--	--	4.48	
June	7.91	7.42	1.74		10.61	8.27	5.43		--	--	--	
July	--	6.92	2.83		9.55	7.69	6.97		--	--	--	
August	--	--	1.87		8.11	7.92	6.03		--	--	--	
September	--	--	--		3.81	7.92	6.33		--	--	--	
October	--	7.63	--		2.61	6.22	5.63		--	--	--	
November	4.02	3.03	3.03		8.34	8.54	2.61		12.80	10.80	7.48	
December	4.22	3.23	3.03		9.46	6.77	3.13		14.00	10.80	6.64	

-- = Not available.

Source: National Agricultural Statistics Service, USDA.

Table 18--Selected citrus, packinghouse-door returns, by month, 1991-94

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
--Dollars per box--												
ORANGES:												
Arizona												
1991	19.33	16.40	22.68	17.38	21.65	8.82	--	--	--	--	15.59	13.18
1992	11.46	7.44	5.48	5.22	4.26	3.64	2.80	--	--	12.11	9.21	7.86
1993	7.13	4.18	3.48	3.36	3.26	3.13	-1.62	--	--	--	13.11	7.28
1994	5.86	5.65										
Florida												
1991	7.41	7.83	8.35	8.53	8.66	--	--	--	--	10.37	7.14	7.08
1992	7.30	7.76	8.14	8.52	8.90	9.56	--	--	--	--	4.43	4.31
1993	4.11	4.11	4.35	5.06	5.38	5.66	--	--	--	13.79	5.17	5.24
1994	5.63	5.99										
California												
1991	7.87	9.53	16.17	21.89	22.60	22.02	19.91	20.96	23.62	22.92	16.11	12.83
1992	11.50	8.17	6.89	6.40	6.28	4.79	3.83	3.01	3.03	4.33	7.30	7.63
1993	6.58	5.78	5.37	5.85	6.14	6.15	7.07	9.42	12.67	14.06	13.56	9.54
1994	7.56	6.28										
Texas												
1991	--	--	--	--	--	--	--	--	--	--	14.70	16.10
1992	13.60	13.10	--	--	--	--	--	--	--	--	11.02	11.44
1993	6.82	6.43	8.33	7.29	7.52	--	--	--	--	10.80	6.84	7.93
1994	7.71	7.42										
GRAPEFRUIT:												
Arizona												
1991	7.62	8.41	9.34	6.93	6.26	6.34	--	--	--	--	5.73	5.78
1992	6.02	5.87	5.91	6.38	6.27	6.21	5.30	--	--	9.39	4.88	4.83
1993	5.01	4.54	3.30	3.48	1.48	1.84	2.25	2.62	--	--	5.00	4.33
1994	3.64	4.26										
Florida												
1991	7.34	6.37	7.36	7.51	6.35	--	--	--	10.80	8.28	8.17	7.78
1992	7.67	7.85	8.86	9.77	--	--	--	--	--	7.77	5.94	5.56
1993	4.55	4.09	3.20	3.63	3.28	3.19	--	--	--	10.21	5.90	5.76
1994	4.84	4.99										
California												
1991	9.94	7.20	7.55	6.98	6.02	7.40	6.59	5.40	3.11	3.23	8.88	9.15
1992	7.49	6.21	6.35	6.30	6.11	6.66	6.03	5.86	6.36	6.12	9.57	7.60
1993	6.68	4.60	3.54	2.83	2.63	3.85	6.03	4.46	5.48	4.39	2.86	4.03
1994	3.35	2.05										
Texas												
1991	--	--	--	--	--	--	--	--	--	--	14.40	15.60
1992	15.60	--	--	--	--	--	--	--	--	--	12.40	12.24
1993	7.74	6.69	5.03	4.98	3.79	--	--	--	--	10.55	5.67	7.13
1994	4.48	3.65										
LEMONS:												
Arizona												
1991	13.67	11.74	15.41	--	--	--	--	--	32.81	25.56	16.64	9.38
1992	7.96	5.79	5.32	5.25	--	--	--	21.74	16.95	10.11	6.87	6.96
1993	6.81	6.05	5.29	5.86	--	--	--	--	29.81	29.62	13.16	7.40
1994	6.26	3.68										
California												
1991	9.28	13.97	17.36	21.02	24.01	21.79	25.36	23.65	24.16	21.72	15.17	6.13
1992	7.30	8.66	10.02	10.67	10.93	12.45	12.70	13.00	14.91	6.86	5.47	6.18
1993	6.47	6.50	6.49	7.49	11.62	18.51	23.07	27.11	23.34	20.03	11.51	8.24
1994	4.71	3.92										
TANGERINES:												
Arizona												
1991	21.09	15.56	21.97	--	--	--	--	--	--	--	15.54	17.13
1992	16.14	11.65	8.50	7.38	8.04	--	--	--	--	--	11.80	14.06
1993	13.59	11.15	9.51	8.87	--	--	--	--	--	--	17.23	12.02
1994	13.61	10.69										
Florida												
1991	21.77	19.18	22.17	--	--	--	--	--	--	26.13	26.46	17.62
1992	18.69	17.70	21.97	--	--	--	--	--	--	16.18	21.09	15.16
1993	17.35	11.85	15.98	20.03	--	--	--	--	--	32.29	23.16	11.06
1994	5.65	11.57										
California												
1991	22.03	4.69	21.28	19.63	14.82	--	--	--	--	39.78	31.64	19.18
1992	14.16	9.43	7.99	8.58	8.75	3.74	--	--	--	21.90	14.31	11.90
1993	9.95	10.04	12.54	3.65	-0.48	--	--	--	--	--	20.49	13.53
1994	9.18	7.96										

-- = Insufficient marketing to establish price.

Source: National Agricultural Statistics Service, USDA.

Tighter Supplies and High Quality Raise Noncitrus Crop Value

U.S. apple, peach, and pear production in 1993 was about the same as in 1992, while grape, plum, and cherry output declined. Higher prices prevailed, and the total value of U.S. noncitrus fruit production rose.

A dry, hot summer lowered fruit yields in the eastern United States, while cool, wet weather delayed harvest in the Central and Western States in 1993. Utilized production of noncitrus fruit, including berries, was down about 5 percent from 1992, but 3 percent more than in 1991 or 1990. Preliminary estimates for crops harvested in 1993 reveal higher grower prices for many noncitrus fruits: apples, California apricots, cherries, peaches, nectarines, and California plums. Prices averaged lower for grapes and pears.

U.S. apple production was about the same in 1993 as in 1992. However, Washington produced 8 percent more apples in 1993 and quality was very high. Apple crops were smaller in the Northeast, where production was off

25 to 40 percent from the prior year. Apple prices were supported by high quality in the West and drought-reduced output in the East.

Prices Lower for Processing Grapes

Grape production dropped back 7 percent from 1992 and was about the same as 1990 and 1991. USDA's preliminary estimate of the value of grape production was down 12 percent in 1993, the lowest in 3 years, as processing prices dropped along with total grape production. The 1993 grape crop was 86 percent processed and the U.S. average grower price for grapes that were crushed, canned, or dried was 21 percent lower than the prior year. Stocks of wine and juice were high following the large 1992

Table 19--Utilized production and value of noncitrus fruit, United States, 1991-93

Crop	Utilized production			Value of utilized production		
	1991	1992	1993	1991	1992	1993
	--1,000 short tons--			--1,000 dollars--		
Apples	4,829.4	5,237.2	5,247.7	1,733,133	1,431,453	1,557,425
Apricots	91.8	106.3	96.3	37,356	37,838	38,399
Avocados	184.7	291.6	4/	196,386	118,120	4/
Bananas	5.7	6.0	5.5	4,674	4,920	4,290
Berries	3/	127.0	146.0	3/	204,307	187,267
Cherries, sweet	139.9	192.1	160.6	135,410	175,673	190,897
Cherries, tart	94.9	156.5	130.8	88,082	55,230	4/
Cranberries	211.0	208.0	197.9	206,616	214,767	5/
Dates	22.0	21.0	24.0	21,340	22,260	26,160
Figs, California	45.1	46.9	51.0	16,626	18,985	24,597
Grapes	5,555.3	6,032.2	5,631.6	1,735,267	1,848,612	1,630,322
Guavas	7.0	6.6	4/	2,044	1,896	4/
Kiwifruit, California	26.8	47.7	40.3	21,976	13,833	4/
Nectarines, California	215.0	236.0	205.0	86,457	73,710	102,421
Olives, California	65.0	165.0	122.0	36,306	92,206	68,776
Papayas	27.7	35.7	32.0	16,228	14,415	14,100
Peaches	1,253.2	1,239.9	1,245.3	394,435	378,652	398,221
Pears	903.5	924.2	932.8	273,930	273,188	275,270
Pineapples	555.0	550.0	370.0	107,775	102,100	79,850
Plums, California	218.0	250.0	185.0	97,894	63,033	93,954
Prunes, California	589.0	534.0	374.0	175,780	189,520	4/
Plums & prunes 1/	23.8	44.4	25.9	6,747	8,524	4,863
Strawberries	684.5	657.7	711.9	634,028	685,926	746,874
Total 2/	15,748.3	17,116.0	15,935.6	6,028,490	6,029,168	6,053,328

1/ Idaho, Michigan, Oregon, and Washington. 2/ Total in 1993 computed by ERS use prior 3-year averages of crops for which data were not available.

3/ U.S. estimates not available prior to 1992. 4/ Data available July 8, 1994. 5/ Data available August 16, 1994.

Source: National Agricultural Statistics Service, USDA.

crush and increased wine imports. Prices of 1993 grapes used for wine and juice dropped about 25 percent.

Concord grape production was up 11 percent to 481,920 tons. Washington remained the leading producer of Concord grapes, with output increasing 65 percent in 1993 to 292,000 tons. New York remained the second largest producer, despite a 37 percent smaller crop of 84,000 tons. Spring freeze damage and summer drought in 1993, as well as large crops the prior 2 years, were behind New York's lower grape output.

More Fresh Peaches and Pears in 1993/94

U.S. peach production was about the same in 1993 as in 1992. Decreased California output (clingstone down 7 percent and freestone down 6 percent) was offset by increased peach production in the Southeast as output bounced back from freeze-reduced 1992 levels. Production of peaches outside of California was 15 percent higher in 1993 than the year earlier. Fresh utilization of the 1993 U.S. peach crop was up 7 percent from 1992.

The value of California's clingstone peaches (mostly canned) came down 6 percent from 1992 to \$113 million, a result of reduced production and steady prices. However, the value of California and other States' freestone

peach production rose about 10 percent to \$285 million in 1993. About 80 percent of the 1993 freestone crop was used fresh and prices were strong. USDA's preliminary estimate of the 1993 U.S. average grower price for fresh-market peaches was up 4 percent from the year earlier.

Utilized production of all pears was up less than 1 percent in 1993 from 1992. However, Bartlett pear production dropped 8 percent, to 514,000 tons, with 75 percent of the crop canned. Demand for canning pears was weak and processing prices averaged \$225 a ton, 4 percent less than in 1992. Production of other types of pears increased 17 percent in 1993 to 385,000 tons and 90 percent were used fresh. Average grower prices for fresh-market, other-than-Bartlett pears averaged \$393 a ton in 1993, down just 3 percent from the prior year.

Short Plum and Cherry Crops Raise Prices

California's 1993 plum crop was about three-fourths of the 1992 crop and prune output fell by about one-third (dried basis). California plum prices more than doubled. Plum output from other States (Idaho, Michigan, Oregon, and Washington) was down 42 percent from 1992. Canning plum prices in those four States averaged nearly 20 percent higher in 1993, but quality problems dropped the fresh price 15 percent from the prior year.

Table 20--Peaches: Total production and season-average prices received by growers, 1991, 1992, and 1993

State	Production			Price per short ton		
	1991	1992	1993	1991	1992	1993
	--1,000 short tons--			--Dollars--		
Alabama	8.0	6.5	7.5	426	626	658
Arkansas	6.0	6.0	12.0	500	442	280
California						
Clingstone	515.0	591.5	548.5	218	216	218
Freestone	313.5	321.0	302.5	264	248	298
Colorado	1.0	9.0	9.0	760	666	622
Georgia	75.0	65.0	75.0	482	452	450
Illinois	9.8	9.0	8.0	660	552	598
Michigan	20.0	25.0	24.0	348	338	376
New Jersey	57.5	42.5	45.0	506	638	596
New York	7.5	7.0	4.5	548	524	592
North Carolina	17.5	6.0	17.5	352	392	402
Oklahoma	15.5	2.5	10.0	610	912	704
Oregon	6.5	7.5	7.0	712	644	482
Pennsylvania	50.0	45.0	50.0	402	446	420
South Carolina	155.0	85.0	110.0	354	416	334
Tennessee	3.3	2.1	5.2	600	708	760
Texas	16.0	13.5	12.5	680	740	720
Virginia	13.0	12.5	14.0	382	336	320
Washington	15.0	26.0	23.5	424	412	432
West Virginia	9.0	10.0	9.0	286	310	294
Other States	29.2	36.9	33.6			
United States	1,343.3	1,329.5	1,328.3	314	306	320

Source: National Agricultural Statistics Service; converted to short tons by the Economic Research Service, USDA.

The U.S. cherry crop was smaller in 1993 with output of both sweet and tart varieties down 16 percent from 1992. Michigan is the leading producer of tart cherries and provided nearly 85 percent of the 1993 U.S. crop despite a 6-percent decline in utilized production from the year earlier. Wet spring weather lowered sweet cherry output in the three major States: Washington, Oregon, and California. Sweet cherry utilization is nearly evenly divided between fresh and processed uses on the national level and, with higher prices for both, the value of the 1993 crop was up nearly 9 percent from the 1992.

Winter Damage Possible in Noncitrus Fruit Areas

The winter of 1993/94 has been harsh with low temperatures of 15 to 30 degrees below zero reported in some fruit-producing states. The extreme cold may have damaged fruit buds or even the wood of peach and cherry trees. Hardier species like apples and native grapes are less likely to be damaged and cold weather early in the season brought maximum cold-hardiness to trees and vines.

Pennsylvania had 30-degree-below zero temperatures in some fruit-growing areas. The New York Agricultural Statistics Service reported extensive bud damage to non-native grapes following temperatures of 20 degrees below zero in the Finger Lakes area. Native concord grapes that comprise 70 percent of New York grape production are more winter hardy than non-native wine varieties. In Michigan's fruit growing region, 20-degree-below-zero temperatures may have damaged peaches, plums, and cherries. The cold weather was fairly wide-spread and so is the potential for bud and wood damage to Michigan's stone fruit. The extent of the damage will not be evident until June.

North Carolina reported 15-degrees-below-zero and Georgia had some temperatures in the low-teens in January, but most peach trees in the south apparently escaped winter damage. A cold winter is beneficial by providing peach trees with their required chilling hours. However, after trees have met their chilling-hour requirement, an early warmup can initiate bud break, allowing spring frosts to do more damage to partially open buds.

Table 21--Fruit for processing: Season-average price received by growers, by use and principal State, 1991-93

Fruit, use, & States			1991	1992	1993	Fruit, use, & States			1991	1992	1993
			--Dollars/short tons--						--Dollars/short tons--		
Apricots:						Grapes--California (cont'd):					
Canning						Dried 2/			212	228	202
California			287	282	266	Wine			310	325	236
Freezing						Peaches, clingstone:					
California			308	319	315	Canning					
Drying						California			224	219	224
California 2/			319	306	353	Peaches, freestone:					
Cherries, tart:						Canning					
Processing, all						California			217	213	196
New York			898	360	3/	Freezing					
Michigan			960	340	3/	California			183	182	185
Wisconsin			978	276	3/	Drying					
Cherries, sweet:						California 2/			116	93	82
Processing, all						Pears, Bartlett:					
Oregon			750	713	803	Canning					
Michigan			648	670	665	Washington			215	223	217
Washington			550	537	636	California			245	241	231
Canning						Drying					
Washington			912	796	940	California 2/			150	171	149
Oregon			785	829	913	Prunes and plums:					
Michigan			648	770	740	Canning					
Brining						Michigan			282	224	180
Washington			519	538	583	Prunes:					
Michigan			648	640	640	Drying 2/					
Oregon			750	711	785	California			298	355	3/
Grapes--California											
All processing			273	292	223						

-- = Not available.

1/ California fruits are priced at first delivery point, except prunes, pears for drying, and grapes. Prices of those California fruits and other States fruit are equivalent processing-plant-door returns.

2/ Fresh basis. 3/ Data available July 8, 1994.

Source: National Agricultural Statistics Service, USDA.

Value of Apple Crop Climbs

Higher prices in 1993 raised the value of U.S. apple production 9 percent from 1992. A large, high-quality Washington apple crop boosted exports and supported grower prices.

Firm Apple Output in 1993

U.S. apple production was about the same in 1993 as in 1992 but up nearly 10 percent from 1990 and 1991. Washington produced 8 percent more apples in 1993 and quality was very high. Apple crops were mostly smaller elsewhere, especially in New York and the New England States, where production was off 25 to 40 percent from the prior year.

Apple prices were supported by high quality in the West and drought-reduced output in the East. USDA's preliminary estimate of the 1993 season-average grower price for apples was 14.8 cents a pound, up 8 percent from 1992's revised average of 13.7 cents. The combination of stable production and a higher price raised the value of the 1993 U.S. apple crop over \$1.5 billion.

While total apple stocks have been higher than in 1992/93, supplies of some varieties and in some regions are tight. Apple exports to Mexico and Europe are ahead of last year and continued strong export growth is likely. Apple prices are expected to stay above year-earlier levels for the remainder of the 1993/94 marketing season.

Shipments and Prices are Higher

Washington apple shipments were record-high in January 1994 and total fresh-market shipments in the 1993/94 marketing year are expected to break the previous record established in 1989/90. Washington shippers had moved about 40 percent of the fresh crop by February 1, 1994. In December 1993 and January 1994, f.o.b. prices of Red Delicious apples (Washington Extra Fancy 80's) averaged just 3 percent lower than the prior year, while short supplies of Golden Delicious pushed prices 75 percent higher than a year ago.

Apple Stocks Differ by Region and Variety

According to the International Apple Institute, total U.S. apple stocks on March 1, 1994, were 5 percent above a year earlier. Apples intended for the fresh-market were up 7 percent and processing apple stocks were 1 percent lower. By region, apple stocks were higher in the West (up 13 percent) and the South (up 10 percent), but lower in the Northeast (down 30 percent) and in the Central region (down 15 percent).

More than half of the apples in storage on March 1, 1994, were Red Delicious and there were 26 percent more than at the same time last year. Golden Delicious were in

much shorter supply, 22 percent less than in 1993 and 6 percent below the 5-year average. Stocks of Granny Smith apples, mostly in the West, were about the same as the year before, but 68 percent higher than the 5-year average. McIntosh holdings, mostly in the Northeast, were down 47 percent from the year earlier and 19 percent from the 5-year average.

Strong Apple Export Prospects

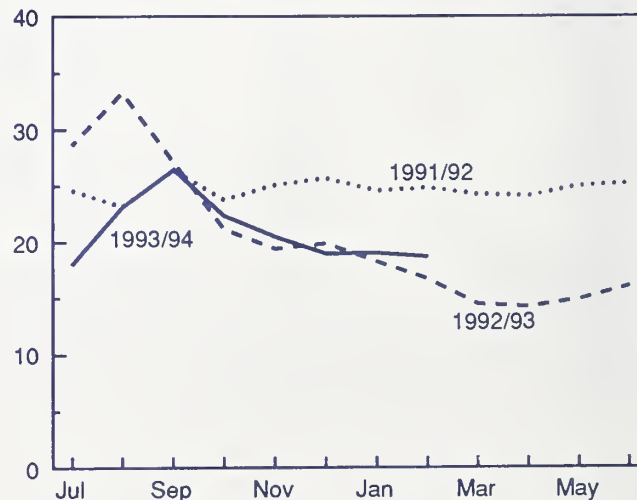
Increased apple exports will continue to help clear out supplies and support prices. U.S. fresh-market apple exports from August through December 1993 were up 6 percent from the same period in 1992. Although exports to Taiwan, the largest U.S. apple export market in 1992/93, were down 30 percent, exports to Mexico and Central America were each up more than 30 percent. A smaller European apple crop raised demand for U.S. apples, and exports to Europe were up 50 percent from the same period in 1992.

Resolution of a trade issue with Canada may bolster apple exports. The Canadian International Trade Tribunal (CITT) removed minimum price restrictions on U.S. Red Delicious and Golden Delicious apples imported to Canada. Anti-dumping duties paid by Canadian importers were equal to the difference between the selling price and a "normal value." The decision to remove restrictions that had been in effect several years was made at hearings held in December 1993 and was effective immediately. The CITT rescinded the anti-dumping order in early February 1994. Removal of the normal value restriction will allow U.S. exporters

Figure 8

U.S. Fresh Apple Grower Prices

Cents/lb.



to offer a full range of competitively priced apples in the Canadian market, thus encouraging U.S. exports.

Prospects of exporting apples to China are good. In December 1993, Chinese plant health authorities agreed to allow imports of Washington apples, the first U.S. horticultural product to legally enter mainland China since 1948. In addition, as part of its application to GATT, China lowered the ad valorem import tariff on fresh apples from 80 to 40 percent, effective January 1, 1994.

Implementation of NAFTA helped ensure that Mexico will be a major and growing market for U.S. apples. The industry projects a 15 percent rise in apple exports to Mexico in 1993/94, which would bring the total to 125,000 tons, exceeding the tonnage of U.S. apple exports to Taiwan in 1992/93. Expanding markets in Mexico and the Far East are most likely to keep U.S. apple exports growing in 1993/94.

Survey Shows Apple Growth Potential

Washington apple area increased to 172,000 acres according to a 1992 survey, up 7 percent from 1986 when a simi-

lar survey was conducted. At the same time, the number of apple trees in Washington increased 47 percent, to 45 million, because of more high-density planting. The average number of trees per acre rose from 190 in 1986 to 262 in 1992. High-density plantings begin to bear fruit and reach full-bearing maturity at an earlier age, which raises the yield per acre of younger trees and boosts production in the first 5-10 years. However, trees planted closer together remain smaller, each tree bears less fruit, and yields per acre may level off earlier than in less dense plantings.

Red Delicious is still the dominant apple variety in Washington, but most new plantings have been of other varieties. According to the 1992 survey, 51 percent of the apple trees were Red Delicious, down from 72 percent in 1986. Plantings of Fuji, Gala, and Braeburn varieties were up sharply from the 1986 survey. In 1992, Fuji apple trees outnumbered Golden Delicious and Granny Smith. The number of Red Delicious trees in Washington increased just 5 percent from 1986, while trees of other varieties increased 155 percent.

Table 22--U.S.-average monthly prices received by growers, 1991/92-1993/94

Month	Fresh apples			Fresh pears		
	1991/92	1992/93	1993/94	1991/92	1992/93	1993/94
--Cents per pound--						
July	24.6	28.6	18.0	15.0	15.0	20.1
August	23.2	33.3	23.1	17.1	13.7	17.7
September	26.4	27.1	26.5	17.9	18.2	20.0
October	23.8	21.2	22.4	20.0	19.5	19.6
November	25.1	19.4	20.5	21.4	21.7	18.1
December	25.7	19.9	19.0	20.7	19.6	16.2
January	24.6	18.3	19.1	18.9	18.5	14.0
February	24.8	16.7	18.7	19.2	20.9	12.8
March	24.3	14.5		19.1	20.6	
April	24.1	14.3		19.7	21.5	
May	25.0	14.9		23.0	25.3	
June	25.2	16.1		--	26.9	
July	28.6	18.0		15.0	20.1	

-- = Insufficient marketing to establish price.

Source: National Agricultural Statistics Service, USDA.

Table 23--Apples, commercial crop 1/: Total production and season-average prices received by growers, 1991-93

	Production 2/			Price per short ton		
State and area	1991	1992	1993	1991	1992	1993
	--1,000 short tons--			--Dollars--		
EASTERN STATES:						
Connecticut	13.5	21.0	12.3	546	432	496
Delaware	12.5	10.5	10.0	218	196	204
Georgia	16.0	12.5	17.0	272	374	290
Maine	34.0	41.5	28.0	458	320	404
Maryland	21.0	25.0	21.0	298	202	232
Massachusetts	31.0	42.5	29.0	508	326	450
New Hampshire	20.0	27.0	16.8	474	340	408
New Jersey	46.0	27.5	37.5	332	270	298
New York	525.0	585.0	435.0	254	198	252
North Carolina	130.0	120.0	145.0	178	150	142
Pennsylvania	235.0	250.0	295.0	204	172	230
Rhode Island	2.8	3.3	2.8	578	554	508
South Carolina	20.0	34.0	25.0	198	288	282
Vermont	26.5	25.0	18.5	434	238	328
Virginia	210.0	185.0	175.0	218	172	178
West Virginia	100.0	112.5	95.0	198	166	198
Total	1,443.3	1,522.3	1,362.9			
CENTRAL STATES:						
Arkansas	5.0	4.0	6.0	338	252	342
Illinois	34.5	44.0	45.0	348	400	344
Indiana	30.0	35.0	40.0	428	326	284
Iowa	4.0	7.0	4.8	580	466	600
Kansas	3.8	3.0	3.5	472	494	448
Kentucky	10.0	8.0	11.0	442	444	388
Michigan	440.0	540.0	500.0	218	170	180
Minnesota	12.7	14.5	12.5	858	740	604
Missouri	20.0	18.5	28.0	416	396	368
Ohio	60.0	57.5	67.5	470	404	388
Tennessee	6.5	6.5	10.5	308	352	346
Wisconsin	30.0	31.5	27.0	416	450	484
Total	656.5	769.5	755.8			
WESTERN STATES:						
Arizona	28.5	45.0	30.5	282	166	132
California	400.0	420.0	425.0	420	406	308
Colorado	37.5	45.0	46.0	312	290	314
Idaho	60.0	37.5	85.0	386	324	340
New Mexico	1.2	7.5	3.5	452	338	554
Oregon	60.0	87.5	70.0	372	206	208
Utah	27.5	30.0	26.5	360	258	284
Washington	2,150.0	2,325.0	2,500.0	440	308	344
Total	2,764.7	2,997.5	3,186.5			
United States	4,864.5	5,289.3	5,305.1	358	274	296

1/ In orchards of 100-or-more bearing age trees.

2/ Includes unharvested production and harvested not sold (1,000 short tons): 1991-35, 1992-52.1, 1993-57.3.

Source: National Agricultural Statistics Service; converted to short tons by the Economic Research Service, USDA.

Smaller California Avocado Crop Raises Prices in 1994

After record-high production in 1992/93, a smaller California avocado crop is expected in 1993/94. The lingering effects of Hurricane Andrew kept Florida's avocado output down.

California Prices Plummet in 1993

Ample avocado supplies in 1993 pushed domestic and export shipments well ahead of the previous year. Grower prices for California avocados dropped by two-thirds from the prior year, to average \$400 a ton. Lower prices brought the value of California avocado production down 38 percent to \$113.6 million in 1992/93. Prices are expected to rise in 1994 with tighter avocado supplies.

According to the California Avocado Commission, the State's 1993/94 avocado production (November through October) is expected to be 150,000 short tons, down sharply from a record-large crop of 284,000 tons in 1992/93. California avocado shipments from November 1993 to March 1994 totaled 50,500 tons, down 15 percent from the same period the prior year. However, anticipation of lower output brought early-season prices up. In December 1993 and January 1994, prices of Hass avocados averaged 50-80 percent higher than the year earlier.

Meager Florida Avocado Crop Anticipated

Florida's 1992/93 avocado crop was the smallest in more than 20 years as production dropped 74 percent from the prior year. Hurricane Andrew destroyed most of the unharvested fruit in Dade County on August 24, 1992, and did extensive tree damage, reducing avocado acreage in Florida by 27 percent. Growers successfully rehabilitated some damaged trees, but resetting in established groves has been limited by a shortage of nursery stock.

A high quality but very limited avocado crop of less than 5,000 tons was harvested in 1993/94 (June-March). The bloom was reduced by severe pruning following the hurricane as well another storm with strong winds in March 1993. Rehabilitated trees are in excellent condition and Florida is expected to produce 10,000-15,000 tons of avocados in 1994/95.

Low Prices Boost Avocado Exports in 1992/93

More ample California avocado supplies and lower prices boosted exports in 1992/93. Canada, Japan, and the European Union (EU, formerly referred to as the European Community, EC or EC-12) remain the top three markets for U.S. avocados. Total U.S. avocado exports more than doubled and exports to Europe were five times as high in 1992/93 as the prior year. A smaller U.S. crop will dampen avocado exports in 1994. Early in March 1994, season-to-date California avocado exports were barely 10 percent of the year earlier.

Pest and disease restrictions on imports of Mexican avocados to the United States remain in place after the passage of NAFTA. Mexican avocados have been banned from the United States since 1918 to protect California groves from infestation of the seed weevil, which has been known to inhabit Mexican groves. Early last year, importers were allowed to apply for permits to ship avocados from Mexico to Alaska, but not to other States. Mexico exports avocados to Canada and Japan in competition with California avocados for part of the season.

Figure 9

U.S. Exports of Fresh Avocados

1,000 short tons

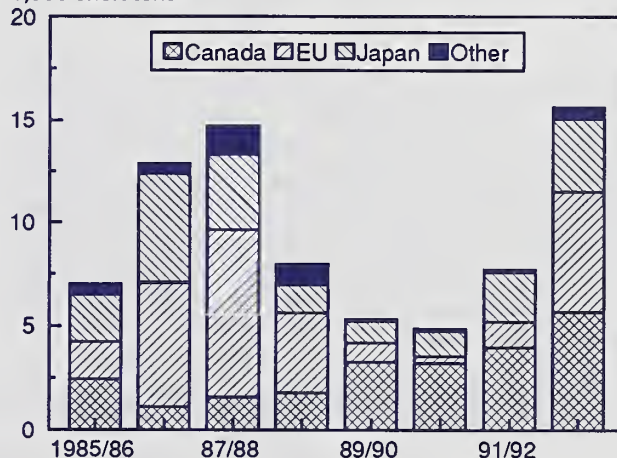


Table 24--U.S. avocado production, by State, 1980/81-1992/93

Crop year 1/	Florida	California	Hawaii	Total
--1,000 short tons--				
1980/81	30.8	238.0	0.76	269.6
1981/82	25.8	157.0	0.60	183.4
1982/83	34.7	202.0	0.80	237.5
1983/84	27.0	247.0	0.59	274.6
1984/85	29.5	200.0	0.58	230.1
1985/86	28.5	160.0	0.61	189.1
1986/87	24.7	278.0	0.65	303.4
1987/88	29.0	180.0	0.45	209.5
1988/89	27.0	165.0	0.60	192.6
1989/90	33.5	105.0	0.55	139.1
1990/91	19.6	136.0	0.45	156.1
1991/92	28.3	156.0	0.42	184.7
1992/93	7.2	284.0	0.35	291.6

1/ Crop years begin: California, November; Florida, June; and Hawaii, January of first year shown.

Source: National Agricultural Statistics Service, USDA and Hawaii Agricultural Statistics Service.

Value of Strawberry Production Up 9 Percent in 1993

A larger California strawberry crop and higher prices increased the value of U.S. production to a record \$747 million in 1993. More cultivated blueberry output brought lower prices, while cranberry output dipped in 1993.

Record-High U.S. Strawberry Production in 1993

The 1993 U.S. strawberry crop was estimated at a record-high 711,900 short tons. Strong demand for the good quality crop supported prices. A dip in the California average price was overshadowed by increased prices in Florida and other States. USDA's preliminary estimate of the 1993 U.S. average grower price for fresh-market strawberries was almost 3 percent higher than in 1992, while prices for processing strawberries averaged about 15 percent higher due to low frozen carryover from 1992. Increased production coupled with higher grower prices brought the value of the 1993 U.S. strawberry crop up 9 percent.

California's 1993 strawberry production was up 10 percent from the prior year and accounted for 80 percent of the U.S. crop. Florida's 1992/93 strawberry output was down about 2 percent from a record-large crop the prior year. Although the 1993 Oregon strawberry crop was up slightly from the prior 2 years, it was 13 percent less than the 5-year average. Strawberry production in 10 other States that amounted to 6 percent of the 1993 U.S. total was up 6 percent from 1992.

Frozen Strawberry Stocks Stack Up

According to USDA's *Cold Storage* report, frozen strawberry stocks as of January 31, 1994, were 93,900 short

Figure 10

U.S. Fresh Strawberry Grower Prices

\$/lb.

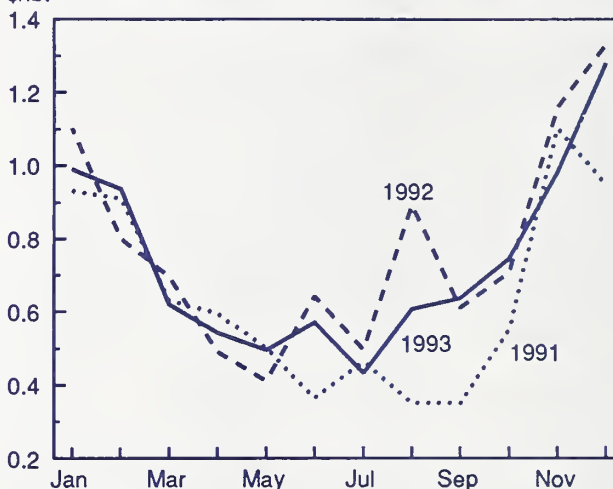


Table 25--Strawberries: Acreage, yield per acre, and production for major States, 1991-93

Crop and State	Acreage			Yield per acre			Production		
	1991	1992	1993	1991	1992	1993	1991	1992	1993
-- Acres harvested --									
Early:									
Florida	5,500	4,700	5,100	13.5	15.0	13.5	66.0	70.5	68.9
Late:									
Arkansas	230	230	230	1.8	1.2	1.5	0.4	0.3	0.4
California	21,100	24,000	25,000	26.0	21.5	22.8	548.6	516.0	568.8
Louisiana	850	1,000	1,100	3.3	6.0	5.0	2.8	6.0	5.5
Michigan	2,100	2,000	1,900	3.1	3.3	3.0	6.5	6.6	5.7
New Jersey	500	500	500	1.9	2.5	1.8	1.0	1.3	0.9
New York	3,400	3,600	3,800	2.8	1.5	3.0	9.5	5.4	11.4
North Carolina	2,200	2,300	2,400	2.8	2.8	2.3	6.1	6.4	5.4
Ohio	1,000	1,000	1,100	2.7	3.6	2.7	2.7	3.6	2.9
Oregon	5,600	6,100	6,200	5.5	5.0	5.0	30.8	30.5	31.0
Pennsylvania	1,600	1,500	1,500	1.9	2.0	1.8	3.1	3.0	2.7
Washington	1,400	1,600	1,600	3.0	3.5	3.5	4.2	5.6	5.6
Wisconsin	1,200	1,100	1,100	2.5	2.5	2.6	3.0	2.7	2.9
Total 1/	46,680	49,630	51,530	14.7	13.3	13.8	684.7	657.9	711.9

1/ Totals may not add due to rounding.

Source: National Agricultural Statistics Service and Economic Research Service, USDA.

tons, up 17 percent from the year earlier and 7 percent more than the prior 3-year average. Nearly one-third of California's large strawberry crop was frozen in 1993, raising the total U.S. frozen pack to a new record of 206,000 tons, up 34 percent from 1992.

Florida's Winter Strawberry Acreage Up in 1993/94

The outlook for the 1994 strawberry crop is favorable. Winter strawberry acreage in Florida was expected to total 5,600 acres, up 10 percent from 1993. Picking began in November, growing conditions have been good, and a substantially larger Florida crop is expected. California's planted acreage is down just slightly from a year earlier and 1994 strawberry output is likely to match 1993's.

Florida's early strawberry shipments were behind last year and f.o.b. prices were higher. In December 1993, fresh Florida strawberry prices averaged \$20 for a flat of 12 1-pint baskets compared to \$16.50 in December 1992. Higher prices persisted in January 1994 when prices for Florida and California strawberries averaged \$17.75 a flat, up \$4 from the year earlier. Prices will come down as shipment volume increases. Florida's peak shipping month is usually March and California's is May.

Bumper Blueberry Crop

U.S. production of berries other than strawberries and cranberries was up 15 percent in 1993, while the value of production declined 8 percent to \$187 million (table 19). Other berries include cultivated blueberries, which accounted for 58 percent of production and 50 percent of value in 1993, raspberries (29 percent of production and 42 percent of value), cultivated blackberries, boysenberries, and loganberries. The value of Oregon blackberry and California raspberry production declined in 1993 and brought total berry value down.

Cultivated blueberry production was up 54 percent in 1993 from the prior year, and although prices averaged 35 percent lower, the value of cultivated blueberry production rose 1 percent to \$94 million. Production in Michigan and New Jersey was back up after spring freezes reduced 1992 output. Maine produces wild blueberries that are not included in USDA's berry data. An 11 percent reduction in Maine's output coupled with the much larger 1993 cultivated crop raised total U.S. blueberry production 26 percent from 1992.

Frozen blueberries are plentiful. According to USDA's *Cold Storage* report, as of January 31, 1994, blueberry stocks were 43,300 tons, up about one-fourth from the same time in 1993 and by one-third from the prior 3-year average. Nearly all of Maine's blueberries and 60 percent of other States' cultivated production are used in processed products.

Cramped Cranberry Supplies

U.S. cranberry production declined again in 1993, down 5 percent from 1992 and 6 percent from 1991. Increased cranberry production in Wisconsin, the second-leading cranberry State, was offset by a decline in Massachusetts, the leading State, and smaller New Jersey, Oregon, and Washington cranberry crops. The summer was too dry for cranberries in Massachusetts, while rainy spring weather in Oregon impeded cranberry pollination.

Less production in 1993 could be associated with higher grower prices for cranberries. However, other factors, such as the quality of the crop and processing demand, also influence price. Cranberry carryover from the 1992/93 marketing year that ended August 31, 1993, was up 22 percent from the year earlier and 25 percent higher than an amount industry sources agree is necessary to meet processing needs throughout the crop year. Low processing demand would signal weaker prices despite a smaller crop. USDA's estimates of cranberry utilization and prices will be published August 16, 1994.

Table 26--Blueberry area and production, by State, 1992-93

State	Area harvested		Utilized production	
	1992	1993	1992	1993
	Acres		Short tons	
Cultivated:				
Alabama	250	90	100	14
Arkansas	700	700	900	1,000
Florida	1,200	1,000	1,050	500
Georgia	3,500	3,700	6,000	2,750
Indiana	750	830	1,250	1,400
Michigan	13,000	15,500	17,000	43,500
New Jersey	7,600	8,100	11,500	16,750
New York	320	280	335	425
North Carolina	2,800	2,900	5,300	7,500
Oregon	1,800	1,900	7,750	8,000
Washington	1,200	1,200	4,080	3,360
Total	33,120	36,200	55,265	85,199
Wild:				
Maine	30,000	30,000	42,097	37,500
United States	62,120	66,200	97,362	122,699

Source: National Agricultural Statistic Service, USDA, and New England Agricultural Statistics Service.

Table 27--Stocks of frozen fruits and berries: January 31, 1991-94

Frozen fruit	1991	1992	1993	1994 1/
	--1,000 short tons--			
Frozen fruit:				
Apples	44.2	46.5	44.6	46.4
Apricots	3.2	3.0	4.4	5.1
Cherries, tart 2/	31.0	24.5	56.0	45.7
Cherries, sweet	6.5	4.0	5.1	4.6
Grapes	2.2	1.7	1.6	3.0
Peaches	47.7	38.0	34.3	46.2
Frozen berries:				
Blackberries	6.7	5.0	11.6	8.0
Blueberries	32.4	30.4	34.5	43.3
Boysenberries	1.7	1.0	1.8	1.6
Raspberries 3/	16.0	13.0	15.9	14.2
Strawberries	87.5	94.9	80.5	93.9
Other	101.2	119.0	168.7	154.9
Total	380.3	380.9	459.1	467.0

1/ Preliminary.

2/ Includes juice cherries.

3/ Includes black raspberries in 1993 and 1994.

Source: National Agricultural Statistics Service, USDA.

Chilean Fruit Production and Exports Up in 1993/94

Chile's production of winter fruit will likely increase 3 percent in 1993/94 and improved quality control will help raise the value of exports. Prices for early shipments of grapes to the United States were higher than last season.

Chilean production of table grapes, pears, and stone fruits are all expected to increase in 1993/94, raising total deciduous fruit production about 3 percent from 1992/93. Production gains are the result of acreage planted in the 1980's reaching mature bearing-age. Recent plantings have been to introduce new varieties rather than expand acreage. Chilean fruit exports are expected to be up from last year and that could mean lower prices for U.S. imports. Although higher in December, port-of-entry prices for Chilean grapes, peaches, nectarines, plums, and pears in the United States were mostly down from the prior year in January and February.

United States a Major Grape Market

Chile is the world's largest exporter of winter fruit, which excludes citrus and tropical fruits and is harvested during the Northern Hemisphere winter. The United States and Europe buy three-fourths of Chile's fruit exports. In 1992/93, nearly 65 percent of Chile's grape exports were shipped to the United States, about 60 percent of peaches and nectarines, and 35 percent of pears, but only 6 percent of apples. Europe typically accounts for 80 percent of Chile's apple exports.

Grapes are Chile's biggest export crop and most come to the United States. In 1993, grapes accounted for two-thirds the value of all fruit the United States imported from Chile. Shipments of Chilean grapes arrive from

Figure 11

U.S. Fruit Imports From Chile

\$million

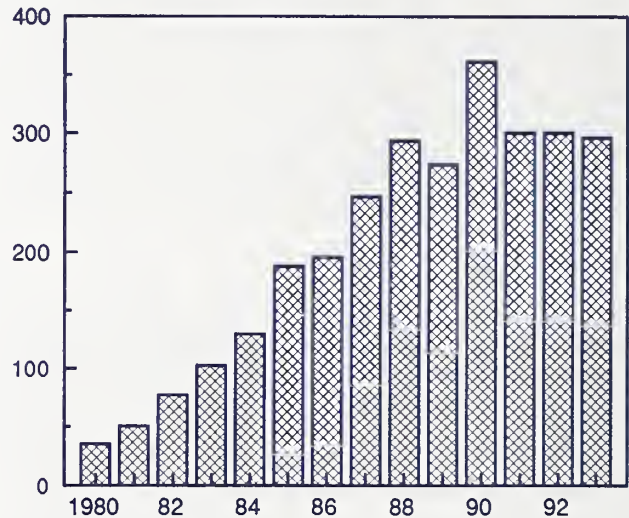


Table 28--U.S. fruit and tree nut imports from Chile, 1990-93

Commodity	Quantity				Value			
	1990	1991	1992	1993	1990	1991	1992	1993
	-- Short tons --				-- Million dollars --			
Fruit - fresh or frozen	530,395	484,915	499,348	487,538	349.4	290.9	296.1	288.8
Apples, fresh	24,397	27,170	29,360	27,845	7.1	8.1	11.6	9.5
Avocados	12,775	15,649	17,743	1,965	18.0	16.0	13.1	1.5
Grapes, fresh	379,674	316,566	306,496	307,772	260.6	198.8	193.7	202.8
Kiwifruit, fresh	691	3,414	13,571	21,436	0.6	2.4	9.7	10.9
Peaches	53,563	55,003	57,969	45,435	31.5	32.7	32.8	26.0
Pears	25,602	29,662	39,287	49,396	8.4	9.1	11.8	14.9
Plums	25,795	26,156	27,840	24,454	14.6	15.0	15.6	14.0
Strawberries, fresh or frozen	44	20	216	323	0.0	0.0	0.2	0.3
Other berries, fresh or frozen	3,677	3,028	2,219	2,297	5.4	4.0	3.9	3.9
Fruit - prepared or preserved	15,010	10,834	4,859	7,064	11.8	10.1	4.9	7.9
Total fruit	545,405	495,748	504,207	494,602	361.1	300.9	301.0	296.7
Nuts & preparations	381	230	424	471	0.72	0.45	0.67	0.85
Brazil nuts	359	224	390	452	0.67	0.41	0.60	0.76
Other nuts	22	7	33	19	0.05	0.04	0.07	0.09
	-- Thousand sse gallons 1/ --							
Fruit juice	22,397	33,575	36,852	38,521	15.6	45.2	55.8	33.6
Apple juice	19,304	29,509	30,602	34,058	12.0	39.4	43.7	26.1
Other fruit juice	971	2,325	3,016	4,170	1.9	4.0	7.4	7.0

1/ SSE = single-strength equivalent.

Source: U.S. Department of Commerce.

December through April, with the most in March. Production of the earliest grapes in the northern areas of Chile was down about 30 percent from the prior year. U.S. prices for Thompson Seedless grapes from Chile in December 1993 were about 15 percent higher than the prior year, but were down in January and February.

Raspberries are the major U.S. berry import from Chile. In 1993, Chile's raspberry production was up 25 percent from the prior year, but the 1994 crop may be smaller. Berries produced from the first flowering in December and January were 10-35 percent below expectations. The U.S. raspberry crop was smaller in 1993 and frozen stocks are down, signalling some high raspberry price potential.

Chile Finds New Markets

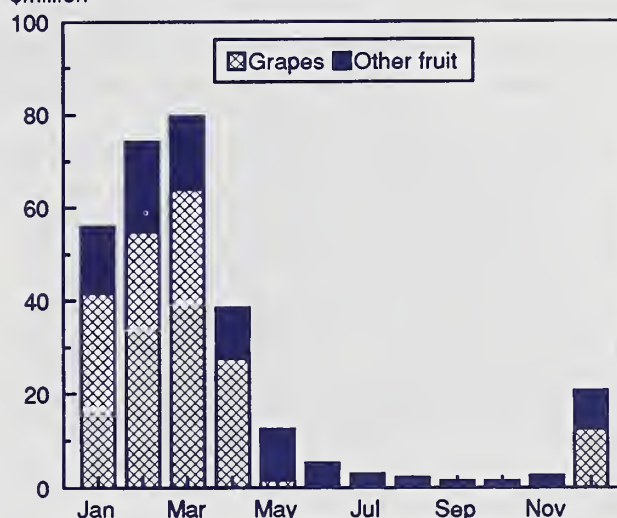
Since the mid-1980's fresh fruit exports from Chile have increased over 70 percent and foreign markets are important to Chilean producers. In 1992/93, about 65 percent of pears, half of the grapes, 45 percent of plums, 40 percent of the apples, and 25 percent of the peaches and nectarines grown in Chile were exported.

Attempts to diversify markets and reduce dependence on exports to the United States and Europe have been fruitful. Chile has free trade agreements with Mexico, Colombia, and Venezuela, as well as phytosanitary agreements and protocols with Japan, South Korea, the Philippines, Malaysia, and New Zealand. Chile accounts for nearly half of Southern Hemisphere noncitrus fruit exports. However, Argentina exports nearly as many apples and pears as Chile. South Africa and New Zealand are also important producers, and Brazil has the potential to grow and export more noncitrus fruit in competition with Chile.

Figure 12

U.S. Imports from Chile, 1993

\$million



Poor quality control is a problem for Chilean fruit exporters. Chile has no mandatory industry-wide grading system, but legislation has been proposed. In the meantime, a group of growers and exporters have initiated a voluntary Minimum Quality Export Program. A USDA pre-shipment clearance program has also helped raise the quality of U.S. imports from Chile. Under the program, fruit can be inspected and approved in Chile for shipment to the United States and, if the high standards are met, no fumigation is required in either country. Benefits of the pre-clearance program include better maturity at harvest, less discoloration from fumigation, and a longer shelf life for fruit.

U.S. Tree Nut Production and Receipts Rise in 1993/94

Tight almond supplies boosted 1993/94 prices and slowed shipments. Large pecan and walnut crops pressured prices. Hazelnut and pistachio production set new records in 1993, while macadamia output declined.

Total U.S. tree nut production rose again in 1993 despite declines in almond and macadamia nut output. Large crops of pecans and walnuts put downward pressure on grower prices. However, almond prices were much higher and the total value of 1993 tree nut crops is likely up nearly 10 percent from the prior year. Growers harvested record-large hazelnut and pistachio crops in 1993 as well, and expanding export markets have helped absorb the excess.

Tight Supply Boosts Almond Price

California almond production in 1993 was 480 million pounds (shelled basis), down 12 percent from the prior year and the smallest output since 1986. Beginning stocks were relatively low when the 1993/94 marketing season began in July, and tight supplies raised the average grower price nearly 40 percent from the 1992 average, the highest since 1986/87. The effect of higher prices swamped lower output, raising the estimated value of 1993 almond production to a record \$846 million, up 22 percent from 1992.

Higher prices dampened domestic and export shipments. The Almond Board of California reported that domestic shipments from July 1993 through February 1994 were off 10 percent from the previous year, while export deliveries were down 7 percent. Exports to Germany, the leading almond destination, were off, but even with the prior year for Japan, the second most important destination. The total value of U.S. almond exports is likely to rise in 1993/94 despite lower export volume. Given the low beginning stocks and small crop, almond ending stocks on June 30, 1994, are expected to be less than 90 million pounds, the lowest since 1987.

Potential for California's 1994 almond crop is good; the trees are healthy and increased output after last year's reduced crop is anticipated. The 4- to 6-week blossom period is critical from mid-February to about the end of March. Heavy rain storms occurred in mid-February when the almond bloom was beginning, but the impact was thought to be minimal.

Pistachio Output Climbs Again

Despite 1993 being an off-year in the alternate-year bearing pattern of California pistachio trees, production was up 3 percent, to 152 million pounds (in-shell basis)

from 147 million pounds in 1992. Many of the trees planted in the 1980's are reaching full-bearing age and boosting per acre yields. California growers harvested a record pistachio crop in 1993.

According to industry reports, California pistachio shipments have not kept pace with the prior year. From September 1993 through February 1994, domestic pistachio shipments were down about 20 percent and exports

Table 29--Tree nuts: Acreage, yield per acre, production, and price, 1991/92-1993/94

Commodity and year	Bearing acreage Acres	Yield per acre Pounds	Production 1,000 lbs.	Grower price \$/pound
Almonds 1/				
1991/92	383,000	1,280	490,000	1.19
1992/93	390,000	1,410	548,000	1.30
1993/94	395,000	1,220	480,000	1.80
Macadamia nuts				
1991/92	18,200	2,720	49,500	0.70
1992/93	17,500	2,740	48,000	0.68
1993/94	18,500	2,540	47,000	0.68
Pistachios				
1991/92	52,300	1,470	77,000	1.25
1992/93	51,800	2,840	147,000	1.03
1993/94	53,100	2,860	152,000	1.07
Hazelnuts				
1991/92	27,470	1,857	51,000	0.36
1992/93	27,030	2,050	55,400	0.28
1993/94	26,930	2,822	76,000	0.25
Walnuts				
1991/92	181,000	2,862	518,000	0.53
1992/93	181,000	2,243	406,000	0.71
1993/94	182,000	2,747	500,000	2/
Pecans				
1991/92	--	--	299,000	1.04
1992/93	--	--	166,000	1.45
1993/94	--	--	352,000	0.62

-- = Not available.

1/ Shelled basis. 2/ Available July 8, 1994.

Source: National Agricultural Statistics Service; converted by the Economic Research Service, USDA.

off 12 percent from the same period in 1992/93. Exports dropped sharply to Germany and Canada, but showed strength in most Far Eastern markets and Mexico.

Large crops in other major pistachio-producing countries boosted world pistachio supplies in 1993/94. Turkey produced a record-large on-year crop of 110 million pounds and Syrian output rose 10 percent in an off-year to 48.5 million pounds. Iran is the world's largest pistachio-producing country, but supply data are unavailable. Pistachios from Iran are the main competition for the United States in most export markets.

USDA's preliminary estimate of the 1993/94 season-average grower price of pistachios was \$1.07 a pound (in-shell), up 3 cents from 1992/93, but well below 1991/92's average of \$1.25 a pound when the crop was half as large. Field prices were established before the large crop was fully realized. A larger California pistachio crop and a higher season-average grower price increased the value of production to a record \$163 million in 1993/94, up from the previous record of \$151 million the year earlier.

The California Pistachio Commission reported February 28, 1994, total pistachio inventory of 104 million pounds, more than twice as high as the year earlier. High carry-over from 1993 would stack up 1994/95 supplies and pressure prices.

Mammoth Pecan Crop Drops Prices

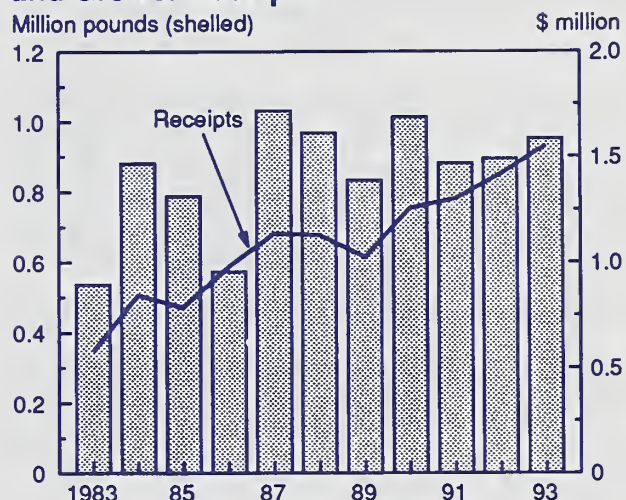
The largest U.S. pecan crop in 30 years was harvested in the fall of 1993. Total production was 352 million pounds (in-shell), well above the most recent high of 339 million pounds in 1981, but not up to 1963's record 376 million pounds. Pecan output in the southern United States bounced back from a disappointing 1992 when low yields resulted in total U.S. production of 176 million pounds, the lowest since 1976. Many acres in the Southeast were not harvested in 1992 because of poor quality nuts.

Pecan production in all 12 reporting States was up from 1992. Georgia was again the leading pecan producer in 1993, with a crop of 130 million pounds, more than four times the 1992 crop. Alabama and Louisiana together produced more than 50 million pounds of pecans in 1993, compared to only 5 million pounds in 1992. Pecan crops in Arkansas, Mississippi, North Carolina, and South Carolina also recovered in 1993 and many set records. Texas was the second largest pecan-producing state in 1993, with output of 70 million pounds, up 11 percent from 1992. New Mexico produced a 36-million-pound crop in 1993, 20 percent larger than the prior year and pecan output in Oklahoma rose by two-thirds to 15 million pounds.

The large crops lowered the preliminary 1993/94 U.S. average grower price for pecans to \$0.62 a pound from a record-high \$1.45 in 1992/93. Increased pecan production was more than offset by reduced prices and the value of pecan production fell to \$217 million, down from \$240 million in 1992/93.

Figure 13

U.S. Tree Nuts Production and Grower Receipts



More Walnut Exports from California

California's 1993 production of English walnuts was up 23 percent from 1992, but 3 percent less than in 1991. Stocks were low when the larger crop was harvested in October. The 1993/94 season-average grower price for walnuts will be released by USDA in July 1994. Strong export demand will help support prices in the face of increased production.

Domestic shipments of shelled walnuts from August 1993 through February 1994 were down 4 percent from a year earlier, while shipments of inshell walnuts were up 15 percent. However, walnut exports outpaced domestic shipments and season-to-date total shipments (shelled basis using last season's shell-out) were 3 percent ahead of February 1993.

U.S. exports of in-shell walnuts (August 1993 through February 1994) were up 15 percent from the year earlier. Increased in-shell walnut shipments to Germany and Italy raised the European total 14 percent. Exports of shelled walnuts to Japan were up 57 percent from the same period in 1992/93. The United States leads the world in walnut production and exports, followed by China. China's walnut production and exports were expected to rise in 1993/94. Australia, Germany, and the United Kingdom are major markets for China's shelled walnuts.

Record Hazelnut Crop in 1993

The 1993 U.S. hazelnut (filbert) crop hit a record 76 million pounds (in-shell), up 37 percent from 1992. High average yields per bearing acre boosted production in Oregon, where 99 percent of U.S. hazelnuts are grown. The maturity of Oregon's bearing acreage continues to rise--trees bear more fruit each year until they reach full-bearing age after about 10 years.

The larger U.S. hazelnut crop brought grower prices down about 10 percent from the previous season. USDA's preliminary estimate of the 1993/94 season-average grower price

was \$0.25 a pound. Lower prices have helped boost U.S. hazelnut exports, which may reach a record in 1993/94. More than one-third of the 1992/93 U.S. hazelnut crop was exported and the share will probably be up in 1993/94. Turkey's smaller crop in 1993 reduced world hazelnut supplies.

Total exports of in-shell hazelnuts from July through December 1993 were 15.9 million pounds, up 14 percent from the prior year. Exports exceeded total domestic shipments of 11.8 million pounds, which were 3 percent less than the prior year. Germany was the leading destination for U.S. hazelnut exports, followed by Canada, Italy, England, and Spain.

Macadamia Nut Production Down 2 Percent in 1993

Hawaiian macadamia nut production dropped again in 1993, the fourth consecutive year of decline since the

record 1989 crop. Dry weather contributed to lower yields by adversely affecting flowering and kernel size, as well as encouraging higher insect populations.

After 3 years of decline, the season-average grower price remained the same in 1993 as in 1992. The steady grower price and lower production brought the value of production for the 1993 crop down to \$32 million, \$1 million less than in 1992, and down \$13 million from the record value set in 1989.

Replacing mature trees that were affected by "macadamia quick decline" reduced bearing acreage from 18,200 acres in 1991 to 17,500 in 1992. However, Hawaiian macadamia acreage rose last year to 18,500 bearing acres while yield per acre dropped due to more young trees with less-than-mature yields.

Table 30--Free-on-board tree nut prices, 1992-93

Month	Almonds		Pecans		Hazelnuts	
	Nonpareil supreme		Fancy halves		Extra large	
	1992	1993	1992	1993	1992	1993
--Dollars per pound--						
January	1.50	1.78	3.40-3.60	4.25-4.85	1.63	1.35
February	1.66-1.70	1.75-1.81	3.40-3.60	4.25-4.85	1.63	1.40-1.45
March	1.66-1.70	1.75-1.81	3.40-3.60	4.25-4.85	1.63	1.40-1.45
April	1.66-1.70	1.90-1.95	3.40-3.60	4.15-4.75	1.63	1.33
May	1.55	1.90-1.95	3.40-3.60	4.15-4.75	--	1.33
June	1.63	--	3.50-3.70	4.15-4.75	1.45	1.35
July	1.60-1.65	2.17-2.20	3.60-3.75	4.15-4.75	1.45	1.40
August	1.60-1.65	2.26-2.35	3.60-3.75	--	1.45	1.45
September	1.70-1.73	2.45	3.75-3.85	--	1.40	--
October	1.70-1.73	2.45	3.95-4.25	--	1.35	1.80-1.85
November	1.70-1.73	2.33-2.60	4.15-4.85	3.25-3.50	1.35	1.60-2.00
December	1.78	2.33-2.60	4.25-4.85	2.95	1.35	1.70-2.00

	Macadamia nuts		Walnuts		Pistachios	
	Style 2		Light halves and pieces		Roasted and salted	
	1992	1993	1992	1993	1992	1993
--Dollars per pound--						
January	4.50	4.50	1.75	2.50-2.60	2.30	--
February	4.25-4.50	4.50	1.75-1.80	2.60-2.70	2.25	--
March	3.80	4.50	1.75-1.80	2.60-2.70	2.25	--
April	3.80	4.50	1.75-1.80	2.80-3.00	2.25	--
May	3.80	4.50	2.05	2.80-3.00	2.25	--
June	4.00	4.50	2.05-2.10	2.80-3.00	2.25	--
July	4.25	4.50	2.10-2.20	2.80-3.10	1.95	--
August	4.25	4.50	2.10-2.20	2.80-3.10	2.00	--
September	4.50	4.50	2.20-2.25	2.70-3.00	2.10	--
October	4.50	4.50	2.35-2.50	2.60-2.75	2.15	--
November	4.50	4.50	2.35-2.45	2.40-2.50	2.15	--
December	4.50	4.50	2.50-2.60	2.40-2.50	2.20	--

-- = Not available.

Source: Food Institute Report, January 1993 and various issues 1993.

Table 31--Fruit and edible tree nuts: Utilized production, 1992-93

Commodity	1992			1993 1/		
	Fresh	Processed	All	Fresh	Processed	All
--Short tons--						
NONCITRUS:						
Apples, commercial	2,890,500	2,346,650	5,237,150	7/	7/	5,247,700
Apricots, 3 States	23,200	83,100	106,300	21,410	74,930	96,340
Avocados 2/	272,550	19,000	291,550	7/	7/	7/
Avocados, California 2/	265,000	19,000	284,000	7/	7/	7/
Bananas, Hawaii	6,000	--	6,000	5,500	--	5,500
Berries 3/	23,936	89,004	127,000	36,398	97,221	146,000
Cherries, sweet	95,420	95,630	191,050	79,810	80,765	160,575
Cherries, tart	4,400	152,100	156,500	3,100	127,700	130,800
Cranberries	11,175	11/ 196,825	208,000	8/	8/	197,900
Dates, California	21,000	10/	21,000	24,000	10/	24,000
Figs, California	1,300	45,600	46,900	21,000	48,900	51,000
Grapes	768,970	5,263,230	6,032,200	777,400	4,854,150	5,631,550
Grapes, California	745,000	4,715,000	5,460,000	750,000	4,250,000	5,000,000
Guavas, Hawaii	--	6,630	6,630	--	7/	7/
Kiwifruit, California	47,700	10/	47,700	40,300	10/	40,300
Nectarines, California	233,000	3,000	236,000	201,000	4,000	205,000
Olives, California	500	164,500	165,000	500	121,500	122,000
Papayas, Hawaii	27,900	7,750	35,650	29,000	3,000	32,000
Peaches	551,150	688,750	1,239,900	588,100	657,200	1,245,300
Pears	444,980	9/ 479,170	924,150	496,700	9/ 436,100	932,800
Pineapples, Hawaii	130,000	420,000	550,000	135,000	235,000	370,000
Plums, California	10/	10/	250,000	10/	10/	185,000
Prunes, California (dried basis)	--	184,000	184,000	--	121,000	121,000
Prunes and plums, other States	21,060	23,340	44,400	14,290	11,640	25,930
Strawberries	490,150	167,550	657,700	493,800	218,100	711,900
--1,000 short tons--						
CITRUS: 4/						
Oranges	2,139	6,770	8,909	2,438	8,624	11,062
Tangerines	189	71	260	181	70	251
Grapefruit	1,249	975	2,224	1,279	1,522	2,801
Lemons	457	309	766	471	459	930
Limes	47	23	70	32	12	44
Tangelos	59	58	117	59	78	137
Templets	38	68	106	43	70	113
--Million pounds--						
TREE NUTS:						
Almonds, California 5/	--	--	548.0	--	--	480.0
Hazelnuts, 2 States	--	--	55.4	--	--	76.0
Macadamia nuts, Hawaii	--	--	48.0	--	--	47.0
Pistachios	--	--	147.0	--	--	152.0
Pecans, all 6/	--	--	166.0	--	--	352.0
Improved	--	--	104.8	--	--	228.4
Native and seedling	--	--	41.1	--	--	102.4
Walnuts, California	--	--	406.0	--	--	500.0

-- = Not available.

1/ Preliminary. 2/ Column headed 1992 refers to 1992/93 crop. 3/ Estimates not available prior to 1992. 4/ Column headed 1992 refers to 1991/92 crop.

5/ Shelled basis. 6/ All pecans includes AZ, KS, MO, and TN, while "improved" and "native and seedling", do not. 7/ Data available July 8, 1994.

8/ Data available August 16, 1994. 9/ Processed mostly canned, but includes small quantities of dried and other uses. 10/ Missing data are not published to avoid disclosure of individual operations. 11/ Includes shrinkage.

Source: National Agricultural Statistics Service; converted to short tons by the Economic Research Service, USDA.

Table 32--Fruit and edible tree nuts: Season-average prices per unit received by growers, 1992-93

Commodity	1992			1993 1/		
	Fresh	Processed	All	Fresh	Processed	All
--Dollars/short tons--						
NONCITRUS: 2/						
Apples, commercial	390	260	274	6/	6/	296
Apricots, 3 States	593	286	356	778	286	356
Avocados 3/	406	400	405	6/	6/	6/
Avocados, California 3/	400	400	400	6/	6/	6/
Bananas, Hawaii	820	--	820	780	--	780
Berries	--	--	1,608	--	--	1,282
Cherries, sweet	1,200	630	915	1,700	685	1,190
Cherries, tart	778	340	352	6/	6/	6/
Cranberries	--	--	1,032	--	--	7/
Dates, California	1,060	--	1,060	1,090	--	1,090
Figs, California	--	--	405	--	--	482
Grapes	426	289	306	678	227	289
Grapes, California	416	292	309	670	223	290
Guavas, Hawaii	--	286	286	--	6/	6/
Kiwifruit, California	290	--	290	6/	--	6/
Nectarines, California	--	--	312	--	--	500
Olives, California	500	559	559	500	564	564
Papayas, Hawaii	500	60	404	480	60	440
Peaches	426	208	306	442	210	320
Pears	378	8/ 221	296	371	8/ 210	295
Pineapples, Hawaii	430	110	186	400	110	216
Plums, California	--	--	252	--	--	508
Prunes, California	--	1,030	1,030	--	6/	6/
Prunes and plums, other States	243	146	192	207	163	188
Strawberries	1,230	494	1,050	1,262	568	1,042
--Dollars/box--						
CITRUS: 4/						
Oranges	7.97	4.72	5.50	6.32	2.20	3.11
Tangerines	19.75	1.05	14.67	16.74	-1.11	11.76
Grapefruit	8.41	3.44	6.23	4.94	0.63	2.60
Lemons	17.03	-1.70	9.47	14.02	-1.48	6.37
Limes	14.08	-0.90	9.12	2.20	-2.18	1.02
Tangelos	9.20	5.10	7.16	5.60	0.77	2.85
Templets	8.50	5.38	6.51	4.40	0.53	2.00
--Dollars/pound--						
TREE NUTS:						
Almonds, California 5/	--	--	1.30	--	--	1.80
Hazelnuts, 2 States	--	--	0.28	--	--	0.25
Macadamia nuts, Hawaii	--	--	0.68	--	--	0.68
Pistachios	--	--	1.03	--	--	1.07
Pecans, all	--	--	1.45	--	--	0.62
Improved	--	--	1.57	--	--	0.66
Native and seedling	--	--	1.14	--	--	0.41
Walnuts, California	--	--	0.71	--	--	6/

-- = Not available.

1/ Preliminary. 2/ Fresh fruit prices are equivalent returns at packinghouse-door for Washington and Oregon, equivalent first delivery-point returns for California, and prices as sold for other States. Processing fruit prices for all States are equivalent returns at processing plant door. 3/ Column headed 1992 refers to 1992/93 crop. 4/ Equivalent on-tree returns; column headed 1992 refers to 1991/92 crop. 5/ Shelled basis. 6/ Data available July 8, 1994. 7/ Data available August 16, 1994. 8/ Processed mostly canned, but includes small quantities of dried and other uses.

Source: National Agricultural Statistics Service; converted to dollars per short ton by the Economic Research Service, USDA.

Table 33--Fruit and edible tree nuts: Value of utilized production, 1992-93

Commodity	1992			1993 1/		
	Fresh	Processed	All	Fresh	Processed	All
--1,000 dollars--						
NONCITRUS:						
Apples, commercial	1,125,360	306,093	1,431,453	6/	6/	1,557,425
Apricots, 3 States	13,758	24,080	37,838	16,657	21,742	38,399
Avocados 2/	110,520	7,600	118,120	6/	6/	6/
Avocados, California 2/	106,000	7,600	113,600	6/	6/	6/
Bananas, Hawaii	4,920	--	4,920	4,290	--	4,290
Berries	52,641	101,842	204,307	64,996	86,781	187,267
Cherries, sweet	114,813	60,860	175,673	135,575	55,322	190,897
Cherries, tart	3,426	51,804	55,230	6/	6/	6/
Cranberries	--	--	214,767	--	--	7/
Dates, California	22,260	--	22,260	26,160	--	26,160
Figs, California	--	--	18,985	--	--	24,597
Grapes	327,286	1,521,326	1,848,612	527,370	1,102,952	1,630,322
Grapes, California	310,160	1,377,065	1,687,225	502,325	949,020	1,451,345
Guavas, Hawaii	--	1,896	1,896	--	6/	6/
Kiwifruit, California	13,833	--	13,833	6/	--	6/
Nectarines, California	--	--	73,710	--	--	102,421
Olives, California	250	91,956	92,206	250	68,526	68,776
Papayas, Hawaii	13,950	465	14,415	13,920	180	14,100
Peaches	235,113	143,539	378,652	260,276	137,945	398,221
Pears	168,028	8/ 105,160	273,188	184,257	8/ 91,013	275,270
Pineapples, Hawaii	55,900	46,200	102,100	54,000	25,850	79,850
Plums, California	--	--	63,033	--	--	93,954
Prunes, California	--	189,520	189,520	--	6/	6/
Prunes and plums, other States	5,119	3,405	8,524	2,961	1,902	4,863
Strawberries	603,165	82,761	685,926	622,840	124,034	746,874
CITRUS: 3/						
Oranges	540,077	1,003,719	1,543,796	527,026	787,643	1,314,669
Tangerines	98,346	5,498	103,844	80,844	2,071	82,915
Grapefruit	312,924	118,453	431,377	211,142	83,016	294,158
Lemons	246,853	14,309	261,162	217,294	24,259	241,553
Limes	20,972	1,855	22,827	5,840	707	6,547
Tangelos	14,508	9,245	23,753	9,870	4,890	14,760
Templets	8,819	11,160	19,979	5,966	4,007	9,973
TREE NUTS:						
Almonds, California 4/	--	--	691,340	--	--	845,820
Hazelnuts, 2 States	--	--	15,304	--	--	18,868
Macadamia nuts, Hawaii	--	--	32,640	--	--	31,960
Pistachios	--	--	151,410	--	--	162,640
Pecans, all 5/	--	--	240,362	--	--	217,412
Improved	--	--	164,333	--	--	151,032
Native and seedling	--	--	46,794	--	--	42,099
Walnuts, California	--	--	286,230	--	--	6/

-- = Not available.

1/ Preliminary. 2/ Column headed 1992 refers to 1992/93 crop. 3/ Column headed 1992 refers to 1991/92 crop. 4/ Shelled basis.

5/ All pecans includes AZ, KS, MO, and TN, while "improved" and "native and seedling", do not. 6/ Data available July 8, 1994.

7/ Data available August 16, 1994. 8/ Processed mostly canned, but includes small quantities of dried and other uses.

Source: National Agricultural Statistics Service, USDA.

Table 34--Production and utilization of specified noncitrus fruits, United States, 1991-93

Commodity and year	Production		Utilization 1/										
	Total	Utilized 2/	Fresh	Processed (fresh equivalent)							Dried	Other 3/	Total 2/
				Canned	Frozen	Brined	Crushed for						
							Wine	Juice	Oil				
--1,000 short tons--													
Apricots:													
1991 4/	95.8	91.8	20.1	43.0	11.0	--	--	--	--	17.0	--	71.7	
1992 4/	106.4	106.3	23.2	53.0	13.0	--	--	--	--	16.0	--	83.1	
1993 4/	96.4	96.3	21.4	44.0	11.5	--	--	--	--	18.0	--	74.9	
Cherries, sweet:													
1991	148.6	139.9	66.7	7.9	--	51.7	--	--	--	--	5/ 13.7	73.2	
1992	205.4	192.1	95.4	11.3	--	66.6	--	--	--	--	5/ 18.8	96.6	
1993	168.6	160.6	79.8	9.3	--	57.8	--	--	--	--	5/ 13.7	80.8	
Cherries, tart:													
1991	95.0	94.9	1.9	30.6	60.2	--	--	--	--	--	2.3	93.0	
1992	167.6	156.5	4.4	40.2	107.0	--	--	--	--	--	5.0	152.1	
1993	161.7	130.8	3.1	44.0	78.7	--	--	--	--	--	5.1	127.7	
Figs:													
1991	45.1	45.1	1.3	--	--	--	--	--	--	43.8	--	43.8	
1992	46.9	46.9	1.3	--	--	--	--	--	--	45.6	--	40.8	
1993	51.0	51.0	2.1	--	--	--	--	--	--	48.9	--	48.9	
Grapes:													
1991	5,555.9	5,555.3	800.4	41.0	--	--	2,717.8	413.6	--	1,582.5	--	4,754.9	
1992	6,051.7	6,032.2	769.0	46.0	--	--	3,237.0	404.5	--	1,575.8	--	5,263.2	
1993	5,640.2	5,631.6	777.4	45.0	--	--	2,726.0	465.0	--	1,618.2	--	4,854.2	
Kiwifruit:													
1991	29.6	26.8	26.8	--	--	--	--	--	--	--	--	--	
1992	52.3	47.7	47.7	--	--	--	--	--	--	--	--	--	
1993	45.3	40.3	40.3	--	--	--	--	--	--	--	--	--	
Nectarines:													
1991	215.0	215.0	211.0	--	--	--	--	--	--	--	--	4.0	
1992	236.0	236.0	233.0	--	--	--	--	--	--	--	--	3.0	
1993	205.0	205.0	201.0	--	--	--	--	--	--	--	--	4.0	
Olives:													
1991	65.0	65.0	0.5	6/ 53.7	--	--	--	--	1.8	--	7/ 9.0	64.5	
1992	165.0	165.0	0.5	6/ 122.0	--	--	--	--	6.0	--	7/ 36.5	164.5	
1993	122.0	122.0	0.5	6/ 93.0	--	--	--	--	5.3	--	7/ 23.2	121.5	
Papayas:													
1991	--	27.7	24.1	--	--	--	--	--	--	--	--	3.6	
1992	--	35.7	27.9	--	--	--	--	--	--	--	--	7.8	
1993	--	32.0	29.0	--	--	--	--	--	--	--	--	3.0	
Peaches:													
1991	1,343.3	1,253.2	616.4	493.6	80.8	--	--	--	--	22.2	40.4	636.9	
1992	1,329.5	1,239.9	551.2	547.8	82.2	--	--	--	--	20.2	38.6	688.8	
1993	1,328.3	1,245.3	588.1	522.3	89.4	--	--	--	--	16.0	29.5	657.2	
Pears:													
1991	903.6	903.5	462.6	8/ 431.6	--	--	--	--	--	9.3	--	440.9	
1992	926.1	924.2	445.0	8/ 469.3	--	--	--	--	--	9.9	--	479.2	
1993	934.2	932.8	496.7	8/ 426.4	--	--	--	--	--	9.7	--	436.1	
Pineapples:													
1991	--	555.0	125.0	--	--	--	--	--	--	--	--	430.0	
1992	--	550.0	130.0	--	--	--	--	--	--	--	--	420.0	
1993	--	370.0	135.0	--	--	--	--	--	--	--	--	235.0	
Plums, CA:													
1991	218.0	218.0	--	--	--	--	--	--	--	--	--	--	
1992	250.0	250.0	--	--	--	--	--	--	--	--	--	--	
1993	185.0	185.0	--	--	--	--	--	--	--	--	--	--	
Prunes, CA:													
1991	589.0	589.0	--	--	--	--	--	--	--	589.0	--	589.0	
1992	534.0	534.0	--	--	--	--	--	--	--	534.0	--	534.0	
1993	374.0	374.0	--	--	--	--	--	--	--	374.0	--	374.0	
Other prunes & plums 9/:													
1991	24.1	23.8	13.0	6.9	1.0	--	--	--	--	3.0	--	10.8	
1992	44.6	44.4	21.1	13.4	0.5	--	--	--	--	9.4	--	23.3	
1993	28.2	25.9	14.3	8.7	0.6	--	--	--	--	2.4	--	11.6	
Strawberries:													
1991	684.8	684.5	485.8	--	--	--	--	--	--	--	--	198.7	
1992	658.1	657.7	490.2	--	--	--	--	--	--	--	--	167.6	
1993	712.2	711.9	493.8	--	--	--	--	--	--	--	--	218.1	

-- = Not available.

1/ For all items except bananas and California apricots, dates, plums, and prunes, some quantities canned, frozen, or otherwise processed are included in other utilization categories to avoid disclosure of individual operations. 2/ Some totals do not add due to rounding. 3/ Tart cherries, juice, wine, and brined; sweet cherries, frozen, juice, etc.; and olives, chopped, minced, brined, and other cures. 4/ Missing data are not published to avoid disclosure of individual operations, but are included in total. 5/ Frozen, juices, and etc. 6/ Canning size fruit only, mostly whole and pitted but also includes some chopped and sliced. 7/ Limited (canned sliced, chopped, wedged and undersize). 8/ Mostly canned, includes small quantities dried; other, excluding California dried pears, uses not published by State to avoid disclosure of individual operations. 9/ Michigan, Idaho, Oregon, and Washington.

Source: National Agricultural Statistics Service, USDA.

Table 35--Value of fruit and tree nut crops, by State, 1992-93

State	Crop value		Share of U.S.	
	1992	1993	1992	1993
	--1,000 dollars--		--Percent--	
Alabama	8,708	17,092	0.1	0.2
Arizona	160,003	112,387	1.6	1.2
Arkansas	9,457	11,396	0.1	0.1
California	5,219,967	5,190,634	53.1	54.3
Colorado	19,617	21,416	0.2	0.2
Connecticut	10,883	8,492	0.1	0.1
Delaware	2,742	2,880	1/	1/
Florida	1,671,709	1,273,337	17.1	13.3
Georgia	87,982	114,345	0.9	1.2
Hawaii	156,293	132,418	1.6	1.4
Idaho	15,731	32,452	0.2	0.3
Illinois	22,539	19,105	0.2	0.2
Indiana	15,134	14,613	0.2	0.2
Iowa	2,986	2,430	1/	1/
Kansas	4,395	1,820	1/	1/
Kentucky	4,403	5,172	1/	0.1
Louisiana	9,745	17,249	0.1	0.2
Maine	12,635	11,110	0.1	0.1
Maryland	8,190	7,294	0.1	0.1
Massachusetts	114,928	111,917	1.2	1.2
Michigan	198,839	213,307	2.0	2.2
Minnesota	8,885	6,402	0.1	0.1
Mississippi	1,060	5,260	1/	0.1
Missouri	10,724	12,319	0.1	0.1
Montana	336	167	1/	1/
New Hampshire	8,820	6,732	0.1	0.1
New Jersey	79,621	83,264	0.8	0.9
New Mexico	51,735	25,339	0.5	0.3
New York	179,957	177,783	1.8	1.9
North Carolina	40,919	48,233	0.4	0.5
Ohio	37,301	34,711	0.4	0.4
Oklahoma	11,389	12,014	0.1	0.1
Oregon	251,150	216,209	2.5	2.3
Pennsylvania	89,662	111,418	0.9	1.2
Rhode Island	1,690	1,270	1/	1/
South Carolina	30,107	37,374	0.3	0.4
Tennessee	3,756	5,736	1/	0.1
Texas	96,410	73,516	1.0	0.8
Utah	16,761	11,590	0.2	0.1
Vermont	4,998	5,576	0.1	0.1
Virginia	35,154	34,265	0.4	0.4
Washington	1,027,975	1,226,286	10.4	12.8
West Virginia	21,023	19,767	0.2	0.2
Wisconsin	87,683	90,634	0.9	0.9
United States	9,854,002	9,566,731	100.0	100.0

1/ Less than 0.05 percent.

Source: National Agricultural Statistics Service, USDA.

Constructed Costs of Producing Oranges in Selected Orange Exporting Countries¹

by

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Abstract: Production costs for well-managed farms, a major factor determining the relative competitive position of orange exporting countries, are developed in this paper. Estimates are made of the price needed for above average managed orange producing farms to maintain their long-term financial viability. Results indicate that break-even costs per hectare are considerably higher in Spain, Israel, and the United States than in Morocco and Egypt. The estimated cost per metric ton ranged from about US\$100 to US\$238, mostly reflecting differences in labor and water costs.

Keywords: Oranges, production costs, competition, Morocco, Egypt, Spain, Israel, United States.

Introduction

World fresh orange trade grew from 2.6 million tons in 1961 to 4.2 million tons in 1992. The United States accounted for 15 percent of this trade in 1992/93, and Mediterranean countries accounted for 73 percent. Spain was by far the leading exporter with 31 percent of the world total and 52 percent of the Mediterranean exports. After Spain and the United States, Morocco, Greece, Italy, and Israel were the major Northern Hemisphere exporters. South Africa, accounted for about 9 percent of world fresh orange exports but 55 percent of exports from Southern Hemisphere countries.

To provide a better understanding of the global fresh orange market, farm production costs, a major factor affecting the competitive position of selected orange exporting countries, are examined in this paper. Farm organizations, machinery complements, variable inputs, and management practices of orange producing farms in selected countries are discussed and estimated long-term break-even costs are presented. The result is a partial analysis of the competitive situation as it covers only five exporting countries and is limited to the relative costs of growing and delivering oranges to a packing house. Packing costs, transportation to major markets, tariffs and non-tariff barriers, and other costs associated with delivering oranges to major markets are not addressed. Countries

considered include Spain, Morocco, Egypt, and Israel in the Mediterranean region (primarily serving the Western and Eastern European and Near Eastern markets) and the United States (primarily serving Pacific Rim markets).

Methodology

A "synthetic" or "constructed farm" approach is used to estimate the long-term break-even price for hypothetical orange farms in the selected countries that likely represent the most profitable technologies, management practices, and farm organization. The break even is defined as that price needed to maintain the long-term financial viability of the farm.

The hypothetical farms were assumed to have above average management and to represent the type of farming operation most likely to attract investment and be competitive in the world market for fresh oranges. Cost information for the hypothetical farms was collected from secondary sources, including individuals close to the citrus industry in each country, on-site visits, and published and unpublished records.

Hypothetical Farms

Despite a wide variation in the level of mechanization, technologies employed, and the size and organization of orange growing farms, a common set of tasks are required to produce oranges. Generally, less mechanization and more labor are used in countries where wages are relatively low, while more mechanization and less labor are used in countries where wages are relatively high. Farm size also affects how tasks involved in growing oranges are mechanized or otherwise accomplished because some machines are efficiently used only on larger farms.

¹Based on a paper presented at the tenth session of the Intergovernmental Group on Citrus Fruit, Food and Agriculture Organization of the United Nations, Albufeira, Portugal, October 1993. Views expressed are those of the authors and not of the U. S. Department of Agriculture.

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Table A-1 summarizes information obtained from each country on the farm size, machinery complement owned by the farm, machine operations hired from off the farm, and irrigation systems used for well managed farms. The hypothetical farms were assumed to specialize in orange production.

Size of Farm and Alternative Machinery Complements Assumed

Some machines used in orange production, such as tractors and blast air sprayers, are most economically used on larger farms. However, the availability of different sized machines and the ability to hire machine services without outright ownership tend to make the small farms relatively more competitive with their larger counterparts. Government "machinery stations" in Egypt and the use of equipment items such as small garden tractors (motocultor) and hand sprayers in Spain are also examples of how relatively small farms can more efficiently use certain machine services.

In all countries considered, farms were assumed to have 50 hectares (123.5 acres) planted to oranges, as this size of operation tends to fully use a single tractor and air sprayer, two of the most expensive machinery items used in orange production. Orange groves of this size exist in each of the countries studied, but in some countries, such

as Spain and Egypt, major barriers exist to the widespread development of larger groves. To estimate break-even costs in those two countries, a second, smaller hypothetical farm was developed assuming less mechanization and more hand labor, the use of smaller equipment, and the hiring of some machine services.

The larger farms in all countries were assumed to have a pickup truck for hauling and transportation, a 30-39 horse power tractor, an air blast power sprayer for insects and other pests, a ground sprayer for weeds, a grove disk for cultivation, and a chopper/shredder. Tree topping and hedging services, extensively used in the United States, are hired, as those machines can only be efficiently used on farms much larger than 50 hectares. In most countries considered in this study, pruning is done primarily by hand.

Irrigation Systems

Relatively water-efficient irrigation systems, such as drip or micro-jets, were assumed on all hypothetical farms, except the smaller, flood-irrigated ones in Spain and Egypt. Also, a substantial part of the new orange grove development in Spain and Egypt is on land not well suited for flood irrigation. Irrigation wells are assumed for the larger farms in Morocco, Spain, Egypt, and Florida, while water from rivers

Table A-1--Machinery complement assumptions used for deriving hypothetical farm costs

Machinery item	Country Hectares	Country or State							
		Morocco 50	Spain 5	Spain 50	Egypt 3.9	Egypt 50	Israel 50	Florida 50	California 50
Machinery complement									
Pick-up		1/ X		X		X	X	X	X
Motocultor (garden tractor)			X						
Tractor (30-39 hp)		X		X		X	X	X	X
Grove disk		X				X			
Ground herbicide sprayer				X		X	X	X	X
Back sprayer (hand carried)		X	X		X				
Sprayer/hose system			X						
Air blast sprayer (PTO driven)		X		X		X	X	X	X
Mower/chopper/shredder		X		X		X	X	X	X
Digger/ringer for planting trees								X	X
Tractor mounted loader								X	X
Trailer			X		X				
Custom operations hired									
Tree topping								X	X
Tree hedging								X	X
Lift pump (irrigation)					X				
Machinery							X		
Irrigation system									
Flood or furrow			X		X				
Drip		X		X		X	X	X	X
Source of irrigation water									
Rivers (dam)			X		X		2/ X		X
Wells		X		X		X	2/ X	X	
Wind machines (frost protection)									X

1/ Eight-tenths of the pick-up cost allocated to orange production. 2/ Mix of river and well water.

and storage reservoirs was assumed for California and for the smaller farms in Spain and Egypt. Total costs for irrigation water reflect the direct purchase of irrigation water and, if assumed, the cost of wells. Specialized wind machines for frost protection are used only in California.

Orange Yields

Although yields vary within each country, the estimated orange yields per hectare were selected to be consistent with the corresponding inputs applied and with above average management given the climates and soils in each country considered.

For inter-country comparisons, all currencies were converted into U.S. dollars per hectare, assuming the exchange rates existing in early June 1993. Costs include the picking and hauling of fruit to local packing sheds. Estimated break-even prices for the eight hypothetical farms in the five countries considered are summarized in table A-2.

Results

Full Economic Costs

Estimated economic or full-ownership costs indicate the average long-run cost that must be covered annually from orange sales to keep land in orange production and to maintain the long-term viability of the farm operation. Full economic costs include annual variable costs, annual fixed costs, capital costs, and a return to land.

Total economic costs ranged from about US\$3,000 per hectare in Egypt to about US\$7,000 in Spain, with costs being relatively high in Spain, Israel, and the United States and relatively low in Egypt and Morocco. Estimated fixed costs were small relative to the variable costs in all countries. Total economic costs per metric ton of oranges produced and delivered to the packing house ranged from US\$88 in Egypt to over US\$238 in Spain.

Variable costs--Variable costs were separated into nine categories: (1) fertilizer, (2) chemicals and biological pest control, (3) hired operations and machine rental, (4) picking and hauling to packing shed door, (5) repairs, fuel lubrication, and electricity, (6) both hired and unpaid labor, (7) purchased irrigation water, (8) interest on operating loans, and (9) miscellaneous costs.

Fertilizer ranged from US\$545 per hectare in Morocco to US\$216 in Israel. Fertilizer expenses per hectare were about the same in Spain and the United States, somewhat higher in Morocco, and lower in Israel and Egypt. Government fertilizer subsidies that were used in the past have generally been discontinued in all countries studied in this report.

Generally, the costs of chemicals were relatively high in Spain and California and relatively low in Egypt. Biological

pest control was used only in the United States, but it was still a relatively small part of total plant protection costs.

Hired machine services and equipment rental expenses were assumed only on farms in the United States and Israel, reflecting tree topping and hedging, and on the Egyptian Delta farm, reflecting the rental of pumping equipment to lift water from the Nile River. The larger Egyptian farm, located in the reclaimed area on the fringe of the Delta, used irrigation wells rather than river water.

Picking and hauling costs per hectare, a major expense on all farms, varied from one country to another, mostly reflecting differences in labor costs and orange yields per hectare. Because picking is by hand in all countries considered, variations in wages among countries cause picking and hauling costs to vary among countries.

Labor costs, excluding picking and hauling, were greatest in Israel and Spain and lowest in Egypt and Morocco. However, it is difficult to make direct comparisons of the labor cost category because, in some instances, labor was included in other variable cost categories such as the hired machine services.

Purchased irrigation water charges were essentially zero for the small Egyptian farms and for farms where it was assumed that irrigation water was obtained from well water. The cost of well water for drip irrigation distribution systems was included in the capital cost category and the cost of the well itself was included in land costs. In Israel, most well and run-off water were pooled and costs per cubic meter of water equalized.

Fixed costs--Fixed costs were separated into three categories: (1) depreciation on trees, (2) real estate and property taxes, (3) and the farm share of vehicle insurance and general farm insurance.

Depreciation for bearing trees on 1 hectare of land ranged from US\$164 in Egypt to over US\$800 in the United States. These costs reflect the total 4- to 6-year establishment costs for new groves divided by the 30- to 45-year expected life of the trees.

Capital costs--Capital costs include replacement, interest on average investment, and taxes for four categories of capital: (1) vehicles, tractors, and equipment, (2) irrigation distribution systems, (3) buildings for shop work and housing machinery, and (4) wind machines for frost protection. For each vehicle, tractor, and piece of equipment, annual capital replacement was estimated based on the average replacement age.

Capital costs depended on the machinery complement assumed on the farm, the irrigation system used, and whether wind machines were required. Capital costs per hectare were highest for the mechanized farms and varied

among the larger farms from US\$208 in Israel to over US\$900 in Spain.

Return to land--A return to land was calculated based on a long-term real interest rate multiplied by the market value of land, excluding the trees, or by the usual rental rate for land. The return to land was quite similar for all countries studied, except Israel, where the allocated return was almost zero due to the government policy of renting land to farmers for very low fees.

Summary and Conclusions

The costs estimated in this report were constructed for hypothetical farms and not directly obtained from a scientific sample of farms from each of the countries considered. However, much of the secondary data and reports containing cost information used to construct the estimated costs is representative. Among the most important factors affecting the long-term break-even price for oranges in the United States and in selected Mediterranean countries were labor and water costs. Wages range widely from about US\$.30

per hour in Egypt and US\$.60 in Morocco to over US\$6 in Israel, Spain, and the United States. Because of relatively low wages, orange production tends to be more labor intensive in Egypt and Morocco. Orange production is more capital intensive in Israel, Spain, and the United States where wages are relatively high. Water costs were relatively high in the United States and Israel.

Because available cost data from various countries are often aggregated differently and are from different sources, individual cost categories in the budgets were not always consistent. This should be considered when interpreting the results. However, the total economic cost comparisons among the countries studied are more reliable, as all costs are thought to be included. The total economic cost estimates are likely better comparisons among countries than any particular cost category in the budget itself.

Further research must also consider the costs of packing oranges, moving the fruit into export market channels, transportation charges to the market, and tariffs and other fees associated with fresh orange marketing.

Table A-2--Break-even costs for constructed orange growing farms

Budget Item	Country	Annual cost per hectare							
		Morocco	Spain	Spain	Egypt	Egypt	Israel	California	Florida
Farm size, hectares		50	5	50	3.9	50	50	50	50
Yield/hectare (Metric tons)		35.00	30.00	30.00	25.64	35.90	40.00	32.43	36.30
\$US									
Variable costs:									
Fertilizer		545	368	424	270	287	216	361	274
Chemicals and biological pest control		370	682	739	373	466	314	852	473
Hired operations and machine rental		0	0	0	104	0	297	173	95
Picking and hauling		1,337	2,143	2,143	194	272	1,601	1,859	1,689
Repairs, fuel, lubrication, & electricity		185	212	92	60	249	91	129	256
Labor		423	1,321	687	531	594	1,785	825	714
Purchased irrigation water		225	393	0	0	0	607	247	1
Insurance on orange crop		0	0	0	0	0	77	0	0
Interest on operating loans		106	389	315	56	64	175	163	136
Miscellaneous		79	66	66	78	93	278	111	199
Total variable expenses		3,270	5,574	4,466	1,666	2,026	5,440	4,720	3,838
Percent of total		72.0	78.0	68.6	66.1	64.0	86.1	70.2	68.8
Fixed expenses:									
Depreciation of trees (replacement)		382	224	224	247	164	574	872	818
Real estate and property tax		0	321	321	28	28	0	185	192
Farm share of vehicle insurance		0	0	0	0	0	99	99	99
Total fixed expenses		382	546	546	275	192	673	1,156	1,108
Percent of total		8.4	7.6	8.4	10.9	6.1	10.6	17.2	19.9
Total variable and fixed expenses		3,652	6,120	5,011	1,941	2,218	6,113	5,876	4,946
Percent of total		80.4	85.6	76.9	77.1	70.1	96.7	87.3	88.7
Capital cost:									
Vehicles, tractors, & equipment:									
Replacement		105	180	81	63	186	83	115	137
Interest		31	163	78	18	59	27	33	36
Taxes, insurance, & housing		4	27	13	0	0	15	19	21
Irrigation system									
Replacement		178	0	414	0	164	59	165	165
Interest		5	0	298	0	35	12	35	35
Taxes, insurance, & housing		0	0	37	0	5	5	15	15
Buildings (dep, tax, & ins)		6	88	9	0	0	6	6	6
Wind machine-(dep, tax, ins, & repair)		0	0	0	0	0	0	118	0
Total capital cost		330	458	930	81	448	208	506	414
Percent of total		7.3	6.4	14.3	3.2	14.2	3.3	7.5	7.4
Return to land		562	571	571	497	497	0	346	216
Percent of total		12.4	8.0	8.8	19.7	15.7	0.0	5.1	3.9
Total economic costs (break even):									
Per hectare		4,543	7,149	6,513	2,519	3,164	6,321	6,728	5,576
Per metric ton		130	238	217	98	88	158	207	154

An Economic Model for Analyzing Alternative Marketing Strategies for California and Arizona Navel Oranges

by

Boyd M. Buxton¹

Abstract: A quadratic programming model is discussed as a tool for analyzing the economic impact of alternative marketing strategies under the California and Arizona navel orange marketing order. Using 1992/93 as a base and assuming competitive conditions, the model estimates seasonal price movements and total industry revenue under alternative marketing strategies. Preliminary estimates are then made assuming the objective is to maximize industry revenue over the entire marketing season. Results indicate that volume control policies in 1992/93 were much closer to the estimated competitive solution than to one that maximized returns to the industry.

Keywords: Navel oranges, volume controls, prorates, quadratic programming, marketing orders.

Introduction

The California and Arizona navel orange marketing order, authorized by the Agricultural Marketing Agreement Act of 1937, allows the use of volume controls on weekly shipments of oranges to the domestic fresh market.² Until their suspension for the entire 1993/94 marketing season, these restrictions had been used every season since the separate navel orange marketing order was established in 1954/55. Volume controls are an important policy issue for the California/Arizona navel industry, the Navel Orange Administrative Committee and the Secretary of Agriculture. The marketing order is administered by an Administrative Committee of 11 members (six growers, four handler representatives, and one nonindustry member) and acts under the direction of the Secretary of Agriculture.

Under the order, the Administrative Committee prepares a "marketing policy statement" prior to the season based on the estimated crop size and expected demand. The policy includes a schedule of the weekly quantity of oranges to ship during the marketing season. The Committee meets weekly during the season to evaluate market conditions and, if appropriate, to recommend changes in the weekly quantity of fresh oranges to be shipped.

The Secretary of Agriculture may approve the Committee's recommendation to increase the shipments or suspend volume restrictions. If the volume controls are approved, weekly shipments are prorated to handlers that pack and distribute the fruit, based on the share of the total crop

under their control, directly or by contract. Handlers are legally bound not to ship more than their prorate allows with some limited ability to shift their prorate between weeks. Volume restrictions were suspended on January 1, 1993, during the 1992/93 season and have not been used so far in the 1993/94 season.

This paper presents an economic model for evaluating the effect of alternative marketing strategies on the pattern of weekly prices and shipments over the season, the average price received by growers, and total industry revenue. Results of several alternative policies are summarized.

Major Factors Affecting the Marketing Decisions for Navels

California and Arizona navel oranges are grown primarily for the fresh market. Fruit that does not meet fresh standards goes into processed products, mostly juice. Unlike non-citrus fruit, navel oranges can be stored on the tree for an extended time after reaching maturity until the decision to market the fruit is made. Once harvested, oranges are moved quickly into the marketing channel. The navel orange marketing season is typically 36 weeks, from late October to early July.

Several key factors affect the growers' timing of harvest during the marketing season. First, oranges reach full size about 20 weeks into the season. Consequently growers would have an economic incentive to delay harvest to obtain higher yields.

A grower's harvesting decision is influenced by the variation over the season in the fresh pack-out rate (percent of fruit harvested that meets fresh standards), which may peak at around 85 percent about 10 weeks into

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²Domestic fresh shipments include exports to Canada. There are no restrictions on exports to other countries.

the season, then fall to near 50 percent by season's end. Other things being equal, relatively low pack-out rates early and late in the season would discourage growers from harvesting their fruit during those periods.

Also affecting the marketing decision during the season are risk and the opportunity cost of money. With identical price expectations each week, growers might harvest and market fruit early rather than late. Leaving fruit on trees subjects growers to the additional risks of crop loss because of adverse weather and pests, and interest on money received from an early harvest.

Economic Model

The navel marketing season is specified as a quadratic programming model with 36 weekly domestic and 36 weekly export demand equations. Linear domestic and export demand equations are calculated from weekly domestic and export shipments and their corresponding prices observed for the 1992/93 marketing season (price/quantity points on weekly domestic and export demand functions) and the assumed fresh domestic and export demand elasticities.

The objective function is written to maximize consumer welfare (area under the demand curves) so that weekly prices and quantities reflect competitive conditions, or to maximize total revenue from the sale of fruit into the domestic, export, and product markets so that weekly prices and quantities reflect a discriminated pricing assumption.

Oranges diverted into products are assumed to be sold at constant prices because most are used for juice that is sold into the global market. Juice production in California and Arizona does not significantly affect world prices. The quadratic model is expressed in mathematical terms in the adjacent box.

The specific objective function is maximized subject to constraints reflecting the total orange crop to be harvested, the weekly pack-out rate, the weekly increase in individual fruit size, the added risks of leaving fruit on the tree an additional week, and any weekly volume restrictions. Weekly fresh domestic and export f.o.b. prices and quantities shipped are solved by the model with total revenue from all sales being calculated from the model solution.

Assumptions

The solution of the economic model reflects the following specific assumptions.

1. The elasticity of demand is -0.65 for fresh domestic oranges and -0.4 for fresh exports. These values are approximated from several demand studies.
2. The percent of oranges harvested that meet export and domestic fresh grades (pack-out rate) begins the

season at about 68 percent, peaks at about 85 percent by the 10th week, then steadily declines to about 50 percent by season's end. These pack-out rates were observed during the 1992/93 season.

3. The relative size of the fruit over the season is about 0.85 at the beginning of the season, about 1.00 by the 13th week, then reaches 1.024 by the 19th week. No growth is assumed through the balance of the season. This means that a given number of oranges would weigh 85 pounds at the beginning of the season, 100 pounds by the 13th week, and a maximum 102.4 pounds by the 19th week. These data are collected by the Navel Orange Administrative Committee.
4. A cost equal to 1 cent per 37 1/2 pound carton is assumed to reflect the risk of delaying harvest 1 week and the foregone interest on money. This reasonable cost was selected for illustration. All of the assumptions can easily be changed to determine their effect on the model results.

Results

The economic model is illustrated using four solutions: (1) a base reflecting the actual 1992/93 navel shipments and prices; (2) domestic fresh shipments restricted 2 percent below the 1992/93 weekly levels from week 5 to 26; (3) restricted shipments that would have maximized total season revenue to the navel industry; and (4) a competitive solution without volume controls and assuming no market power influence by any handlers or cooperatives.

The 1992/93 base solution replicates the actual domestic, export, and processing prices and quantities and total industry revenue for the 1992/93 navel marketing season. The season's total shipments, prices, and revenue are shown in table B-1.

Table B-1--Shipments, prices, and revenue under alternative market strategies, California/Arizona navel oranges

Item	Actual 1992/93 (base)	Volume controls	Maximum revenue	Competitive
1,000 cartons				
Shipments:				
Domestic, fresh	58,307	57,490	44,743	57,834
Export, fresh	7,883	7,821	6,986	7,814
Processed	22,311	23,188	36,771	22,851
Total	88,500	88,500	88,500	88,500
Dollars				
Price/carton				
Domestic, fresh	7.07	7.22	9.60	7.05
Export, fresh	8.91	9.08	11.44	9.04
Processed	0.41	0.41	0.41	0.41
\$ million				
Industry revenue	491.9	495.7	524.9	487.5

Competitiveness objective function (maximize)

$$\sum_{i=1}^{36} \left[\int_0^{FR_i^*} (a_i + b_i FR_i) dFR_i + \int_0^{EX_i^*} (c_i + e_i EX_i) dEX_i + PxPR_i - COST_i HAR_i \right]$$

Subject to:

λ_1 (CROP - $\sum_{i=1}^{36} (HAR_i \times SIZE_i)$)	Crop size restriction
λ_2 ($HAR_i \times SIZE_i - FR_i - EX_i - PR_i$)	Allocation of crop to domestic, export and processing
λ_3 ($HAR_i \times SIZE_i \times PACK_i - FR_i - EX_i$)	Pack-out restriction
λ_4 ($PRO_i - FR_i$)	Prorate restriction
λ_5 ($PEX_i - PFR_i - DIFF$)	Export and domestic price differential

where:

i	= 1 to 36 weeks of marketing season
FR_i	= Domestic fresh shipments in i th week
EX_i	= Export fresh shipments in i th week
PR_i	= Processed shipments in i th week
HAR_i	= Oranges harvested in i th week
PEX_i	= F.o.b. export price per carton in i th week
PFR_i	= F.o.b. domestic price per carton in i th week
P	= F.o.b. processing price
CROP	= Total orange production for season
$SIZE_i$	= Relative size of individual fruit in i th week
$PACK_i$	= Percent of oranges harvested that meet fresh standards in i th week
$COST_i$	= Added cost per carton for holding fruit on tree an additional week in i th week
PRO_i	= Prorate volume restriction in i th week
DIFF	= Differential in f.o.b. export and domestic price
$a_i, b_i, c_i,$ and e_i	= Parameters of domestic and export demand curves for i th week.
FR_i^* and EX_i^*	= Equilibrium fresh domestic and export shipments
λ_i	= Lagrange multipliers, one for each constraint

Revenue objective function (maximize)

$$\sum_{i=1}^{36} \left[(a_i + b_i FR_i) FR_i + (c_i + e_i EX_i) EX_i + PxPR_i \right]$$

Tightening prorate restrictions so as to reduce shipments by 2 percent from week 5 to 26 of the 36-week season would have, for that period, increased f.o.b. prices relative to the actual 1992/93 base (table B-1 and figures B-1 and B-2). The restricted shipments during the regulated period required increased shipments during the nonregulated period from week 27 to the end of the season. Relative to the 1992/93 base, prices would have been higher during the regulated period and lower during the nonregulated period. Total industry revenue would have increased an estimated \$3.8 million due to the 2-percent tighter restrictions from week 5 to 26. Fresh shipments for the entire season would have declined slightly because of increased shipments to the processing market and lower pack-out rates later in the season when a higher proportion of the fruit was harvested. The weighted season-average price for domestic shipments rose from the \$7.07 base to \$7.22 per carton.

Maximizing industry revenue for the entire season would have resulted in a major reallocation of oranges to processing, reducing both domestic and export shipments (table B-1 and figures B-1 and B-2). Given the demand elasticity assumptions, industry revenue would have jumped by an estimated \$33 million while fresh domestic shipments would have declined 23 percent and fresh exports by 11 percent. Processing use would have jumped by 64 percent from the base 1992/93 season. The weighted season-average price for domestic fresh rose from the base \$7.07 to \$9.60 per carton. The revenue maximizing alternative requires market discrimination and power to divert orange from fresh and export markets into processing. Otherwise, relatively large quantities of oranges would remain unsold at the end of the season.

The estimated competitive result, assuming an unregulated market for the entire season and a perfectly competitive market structure, would tend to harvest and ship oranges relatively earlier in the season (table B-1 and figures B-1 and B-2). This would result in lower prices for the first 15 weeks of the season and higher prices for the balance of the season. The general increase in the price of oranges from about the 10th week to the end of the season reflects the assumptions on cost and risks of holding fruit on the tree, declining pack-out rates over the season, and relatively little growth in fruit size later in the season. Industry revenue would have been an estimated \$4 million (about 1 percent) lower than actual 1992/93 revenue.

The pattern of prices over the marketing season for the unregulated competitive solutions differs from the regulated solutions (figure B-1). Prices are lower and reach their

minimum values relatively early in the season before increasing from week to week and ending up above the regulated solutions later in the season. These results are consistent with many agricultural commodities where seasonal prices are lowest at or near harvest then increase, reflecting storage costs. However, in the case of oranges, the increasing prices would reflect the cost of delaying harvest, including lower pack-out rates and risks of crop loss.

Summary and Conclusions

The navel orange marketing order that restricts weekly shipments to the fresh domestic market has important implications for growers, handlers, wholesalers, and consumers. The quadratic programming model, incorporating major factors affecting the economic decisions of marketing navel oranges over the approximately 36-week marketing season, estimates the optimal pattern of domestic and export shipments and resulting prices given a fixed crop of navel oranges. Two objective functions are illustrated, one to reflect competitive marketing conditions and the other to maximize the revenue over the entire season.

Using the 1992/93 marketing season as a base, preliminary conclusions indicate that a 2-percent tighter volume control could increase industry revenue (f.o.b. level) about \$4 million, or less than 1 percent. Revenue could be increased by \$33 million, or about 7 percent, if the volume restrictions were imposed to maximize revenue. Restrictions shift shipments to later in the season, which alters the seasonal price pattern. Without volume restrictions, prices would be lower in the early season and higher in the later season. After an early season low, prices generally would increase over the balance of the season, reflecting the costs associated with holding oranges on trees.

Results indicate that actual prices, quantities, and industry revenue for the 1992/93 season were much closer to the competitive than to the maximizing revenue alternative, suggesting that the price discrimination opportunities were far from being fully exploited. Although this conclusion likely holds for seasons prior to 1992/93, additional analysis would be required.

The quadratic model has substantial flexibility to analyze the price and industry revenue impact of different size crops, variations in quality as reflected by different pack-out rates, alternative risks and costs associated with delaying harvest, different domestic and export demand elasticity estimates, as well as alternative volume control policies. Therefore, the model should be a useful policy analysis tool for government and industry.

Figure B-1

Domestic Navel Orange Prices Under Alternative Marketing Strategies, 1992/93 base

\$/carton

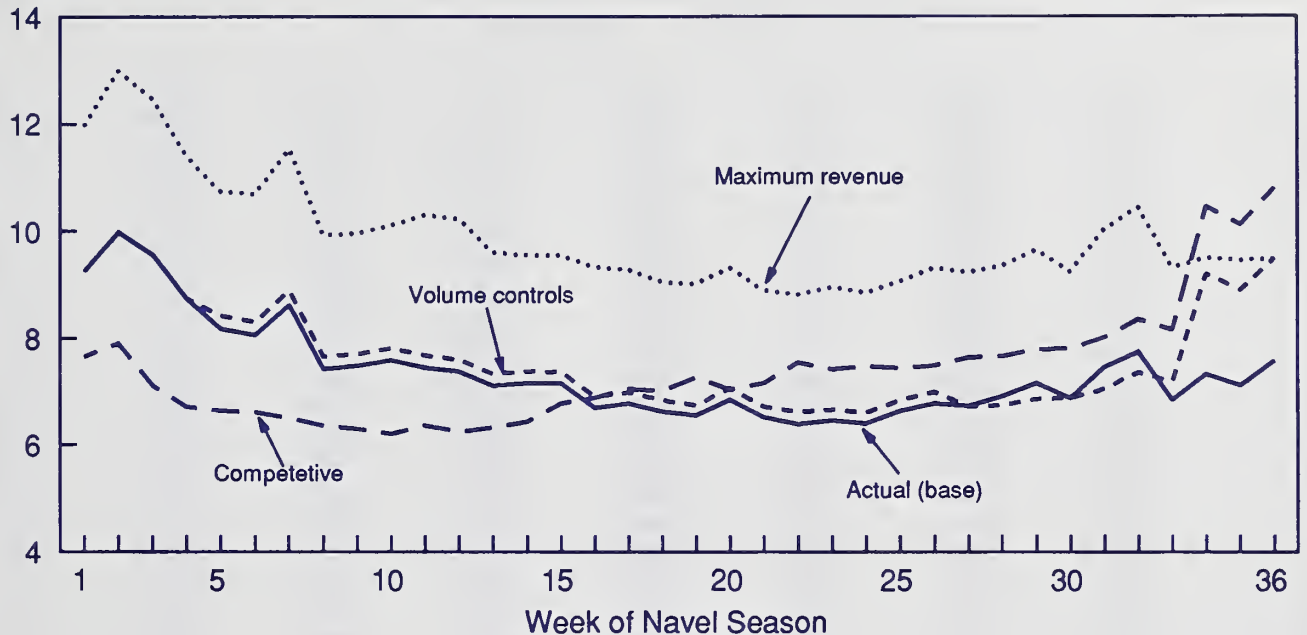


Figure B-2

Domestic Navel Orange Shipments Under Alternative Marketing Strategies, 1992/93 base

1,000 Cartons

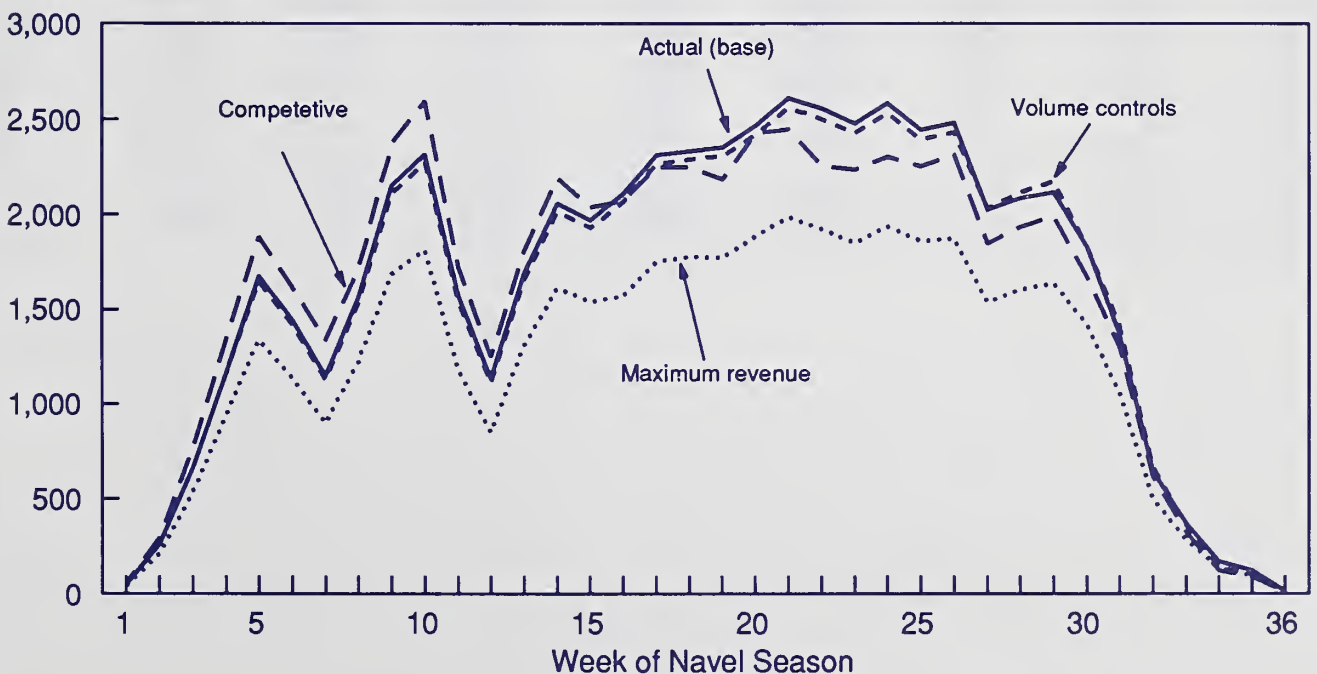


Table B-2--Seasonal domestic and export shipments under alternative marketing strategies

Week of season	Alternative strategies - domestic shipments				Alternative strategies - export shipments			
	Actual	Volume	Maximum	Competitive	Actual	Volume	Maximum	Competitive
	1992/93 (base)	controls	revenue		1992/93 (base)	controls	revenue	
1,000 cartons								
1	51.4	51.4	41.7	57.2	0.0	0.0	0.0	0.0
2	259.0	259.0	208.1	294.0	9.3	9.3	8.3	9.9
3	659.5	659.5	528.9	769.2	25.9	25.9	23.2	28.0
4	1,161.7	1,161.7	933.3	1,337.2	27.0	27.0	24.4	29.1
5	1,676.8	1,643.2	1,336.5	1,881.5	76.9	76.1	69.1	81.5
6	1,445.0	1,416.1	1,140.0	1,615.3	119.1	117.9	106.7	126.0
7	1,147.9	1,125.0	897.4	1,333.4	143.0	141.5	127.4	154.5
8	1,562.3	1,531.0	1,219.8	1,709.3	171.8	170.1	153.5	179.6
9	2,151.3	2,108.3	1,686.8	2,371.6	197.3	195.3	176.6	207.1
10	2,316.7	2,270.3	1,814.6	2,591.8	220.5	218.4	197.3	233.3
11	1,571.6	1,540.3	1,180.2	1,722.0	418.3	414.3	367.8	437.8
12	1,133.0	1,110.4	848.7	1,245.9	309.3	306.3	271.7	324.2
13	1,689.2	1,655.4	1,304.2	1,809.9	228.9	226.7	203.8	236.7
14	2,055.8	2,014.7	1,609.9	2,192.4	158.5	156.9	141.9	163.5
15	1,970.6	1,931.1	1,538.3	2,036.6	165.7	164.1	148.2	168.4
16	2,107.0	2,064.9	1,567.4	2,069.8	562.3	557.0	494.1	557.6
17	2,312.0	2,265.8	1,752.6	2,249.9	426.5	422.5	377.5	421.1
18	2,334.5	2,287.8	1,777.3	2,247.3	373.7	370.2	331.5	367.1
19	2,352.1	2,305.0	1,774.0	2,185.1	446.4	442.2	394.7	431.5
20	2,467.1	2,417.7	1,887.5	2,423.6	344.1	340.8	305.6	341.2
21	2,610.0	2,557.8	1,985.8	2,444.9	386.1	382.5	342.6	374.6
22	2,556.7	2,498.8	1,922.0	2,255.8	470.5	465.5	415.8	444.5
23	2,475.2	2,425.7	1,850.8	2,236.2	509.3	504.5	448.9	486.2
24	2,581.3	2,529.7	1,936.4	2,300.8	480.9	476.4	424.6	456.4
25	2,441.5	2,392.6	1,860.0	2,250.8	316.7	313.7	281.0	305.0
26	2,478.4	2,428.8	1,874.1	2,312.8	395.3	391.5	349.5	382.7
27	2,025.8	2,030.7	1,534.5	1,848.1	294.9	295.2	261.0	282.6
28	2,084.2	2,116.2	1,601.6	1,933.8	190.5	191.9	169.5	183.9
29	2,113.4	2,171.9	1,634.7	1,991.4	145.1	147.0	129.3	141.1
30	1,831.8	1,831.3	1,417.8	1,668.4	100.9	100.9	90.0	96.6
31	1,363.2	1,411.5	1,055.8	1,296.9	85.3	86.8	76.0	83.3
32	644.5	665.9	498.4	611.4	44.5	45.2	39.6	43.4
33	369.8	357.8	282.2	323.3	34.5	33.9	30.6	32.4
34	169.4	139.1	134.5	118.8	3.1	2.8	2.8	2.7
35	121.1	100.7	94.5	87.0	1.0	1.0	0.9	0.9
36	15.9	12.9	13.0	10.9	0.0	0.0	0.0	0.0
Total	58,306.6	57,490.2	44,743.4	57,834.2	7,882.9	7,821.3	6,985.6	7,814.4

Table B-3--Seasonal domestic and export prices under alternative marketing strategies

Week of season	Alternative strategies - domestic f.o.b. prices				Alternative strategies - export f.o.b. prices			
	Actual 1992/93 (base)	Volume controls	Maximum revenue	Competitive	Actual 1992/93 (base)	Volume controls	Maximum revenue	Competitive
\$/carton								
1	9.26	9.26	11.96	7.66	11.26	11.26	13.96	9.66
2	9.98	9.98	12.99	7.90	11.98	11.98	14.99	9.90
3	9.54	9.54	12.45	7.10	11.54	11.54	14.45	9.10
4	8.74	8.74	11.38	6.71	10.74	10.74	13.38	8.71
5	8.18	8.43	10.73	6.64	10.18	10.43	12.73	8.64
6	8.06	8.31	10.68	6.60	10.06	10.31	12.68	8.60
7	8.63	8.90	11.53	6.49	10.63	10.90	13.53	8.49
8	7.42	7.65	9.92	6.35	9.42	9.65	11.92	8.35
9	7.47	7.70	9.95	6.29	9.47	9.70	11.95	8.29
10	7.58	7.81	10.11	6.20	9.58	9.81	12.11	8.20
11	7.45	7.68	10.30	6.35	9.45	9.68	12.30	8.35
12	7.37	7.60	10.22	6.24	9.37	9.60	12.22	8.24
13	7.10	7.32	9.59	6.32	9.10	9.32	11.59	8.32
14	7.15	7.37	9.54	6.42	9.15	9.37	11.54	8.42
15	7.14	7.36	9.55	6.77	9.14	9.36	11.55	8.77
16	6.69	6.90	9.33	6.87	8.69	8.90	11.33	8.87
17	6.76	6.97	9.28	7.04	8.76	8.97	11.28	9.04
18	6.62	6.82	9.05	7.00	8.62	8.82	11.05	9.00
19	6.54	6.74	9.01	7.25	8.54	8.74	11.01	9.25
20	6.84	7.05	9.31	7.03	8.84	9.05	11.31	9.03
21	6.51	6.71	8.91	7.14	8.51	8.71	10.91	9.14
22	6.38	6.60	8.82	7.54	8.38	8.60	10.82	9.54
23	6.45	6.65	8.95	7.41	8.45	8.65	10.95	9.41
24	6.39	6.59	8.85	7.46	8.39	8.59	10.85	9.46
25	6.63	6.83	9.06	7.43	8.63	8.83	11.06	9.43
26	6.77	6.98	9.31	7.47	8.77	8.98	11.31	9.47
27	6.72	6.70	9.23	7.63	8.72	8.70	11.23	9.63
28	6.89	6.73	9.35	7.66	8.89	8.73	11.35	9.66
29	7.15	6.85	9.64	7.79	9.15	8.85	11.64	9.79
30	6.86	6.86	9.25	7.80	8.86	8.86	11.25	9.80
31	7.44	7.04	10.02	8.00	9.44	9.04	12.02	10.00
32	7.74	7.35	10.44	8.35	9.74	9.35	12.44	10.35
33	6.83	7.17	9.32	8.15	8.83	9.17	11.32	10.15
34	7.31	9.19	9.48	10.45	9.31	11.19	11.48	12.45
35	7.10	8.90	9.45	10.12	9.10	10.90	11.45	12.12
36	7.56	9.49	9.47	10.79	9.56	11.49	11.47	12.79

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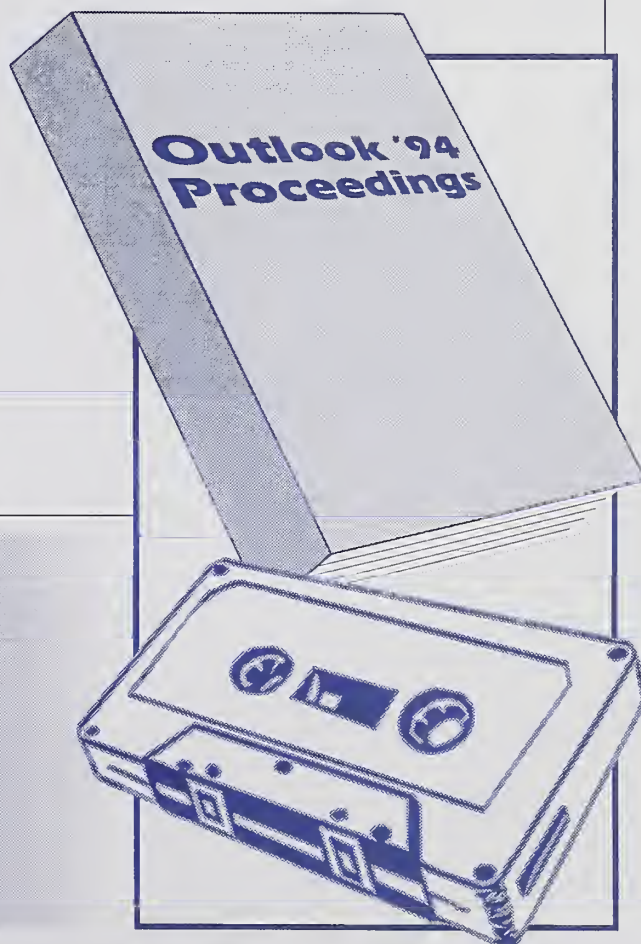
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